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2000

YEARBOOK of
THE HEATHER SOCIETY

ISSN 0440-5757

THE HEATHER SOCIETY

Registered charity No 261407

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FRONT COVER:

Cross-section of *Calluna* floret from A. H. Church 1908: *Types of floral mechanism Part 1*, 47.

(Reproduced by courtesy of The Librarian, Linnean Society, London.) See also p. 34 (this issue).

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THE HEATHER SOCIETY

REGISTERED CHARITY No. 261407

With Compliments

Administrator: Mrs. A. SMALL, DENBEIGH, ALL SAINTS ROAD, CREETING ST. MARY, IPSWICH
SUFFOLK IP6 8PJ
TEL: + 44 (0)1449 711220 FAX: + 44 (0)1449 711220
E-mail: heathers@zetnet.co.uk

ISSN 0440-5757

The Heather Society

c/o Denbeigh, All Saints Road, Creeting St Mary, IPSWICH, Suffolk, IP6 8PJ

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FRONT COVER:

Cross-section of *Calluna* floret

(Reproduced by courtesy of The Botanical Society of the Netherlands)

*Yearbook
of
The Heather Society*

2000

Editor
Dr E. Charles Nelson

Assistant Editor
R. J. Clevely

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Fig. 1. Gerhard Kirsten and Thys de Villiers (right).
See page 57 for *Erica kirstenii*

A rare double for the *Erica* hunters

M. DE VILLIERS

P. O. Box 23, CALEDON 7230, South Africa.

with photographs by **WICKUS LEEUWNER**

The going was tough and slow as the very steep incline was moist, slippery and covered in thick brush. We were on the Riversdale slopes of the Langeberg in the early afternoon of 29 November 1997. The fact that we were *Erica*-hunters and not rock climbers, usually well equipped for this sort of thing, was no excuse. We had to inspect all the shady overhanging rock faces and little caves because conditions seemed as favourable as they could get for *Erica ixanthera* to show itself. Inching along a ledge, I broke through a clump of ferns into an opening at the base of an overhanging cliff. On looking up I could scarcely believe my eyes. The thrill of seeing for the very first time these greenish-white cup-shaped *Erica* bells hanging from a plant on the rock face was better described by the great poet John Keats in his sonnet "On first looking into Chapman's Homer":

*Then felt I like some watcher of the skies
When a new planet swims into his ken; ...*

Could this really be the plant that no humans had seen for 88 years and was presumed extinct by most experts?

The golden age of the early plant hunters in South Africa is long gone. Thousands of species have been discovered, described and named and today the Cape flora is fairly well known. Experts agree that very few unnamed or unknown species may still exist, but many have already been lost because of human encroachment on their domain or because their exact habitats were not properly recorded. If they are not extinct, nor garden hybrids, they must still be out there. To protect them we need to determine their whereabouts.

Because of the diversity of the Cape flora, amateur botanists whose hobby is plant hunting tend to specialize in one family or genus. Participation in the well known *Protea* Atlas project is one such choice of specialization.

But the amateur should be warned against choosing *Erica* which is a very large genus with very variable flowers, habits and habitats. It is not so much the physical difficulties in identifying the plants and getting to know

them, but the danger lies elsewhere. *Ericas* apparently cast a magic spell over many a good person, enslaving them for life!

Imagine a former sports editor of a major newspaper hunting heathers on a Saturday afternoon with no apparent concern about a rugby test-match in progress! Such a man is Gerhard Kirsten. Since he became hooked on heathers about 25 years ago he has spent most of his free time tracking down rare and lost species. Along the way he became an expert on the genus. He has co-written *Ericas of South Africa* with Dolf Schumann and covered every mountain range in the region several times. Once he has set his sights on a lost plant and learnt from herbarium records where and when it was collected, he will systematically search the area during the flowering period, going back year after year. Few lost heathers can withstand such tenacity.

I started to compile a checklist of the *Erica* species on my farm in Caledon (which district has the highest concentration of *Erica* in the world) about 12 years ago and I have located more than 50 species in an area of less than 1,000 hectares (approx. 2,500 acres). As I had come across some rare endemics (plants that occur naturally only in a specific region) Gerhard soon got wind of it and paid me a visit. We became good friends and I often joined him on *Erica* hunting trips. Over the last couple of years most of these joint trips have yielded few results as we never found what we had been looking for, but I still found them delightful experiences and an opportunity to gain from his vast knowledge.

Gerhard has been searching the slopes of the Langeberg every November for the last 15 years for *Erica ixanthera*. In vain. This very special species was discovered by the English collector William Burchell¹ in November 1814. It was found again by Dr John Muir² of Riversdale in 1909 but never since then. In both instances the collection locality was poorly described. We presumed the shape and colour of the flower to be round and pink.

As we planned to give it another go we had very little reason to have higher hopes than usual. Still, how could a plant with quite prominent flowers (about the size of a pea – fairly big for a spherical-shaped *Erica*) be so elusive as to escape dedicated hunting for so long? Maybe the Red Data list was correct in stating that it had become extinct.

On the last weekend of November 1997 we agreed to visit a few kloofs in the area that had not been covered previously. In the morning we scrambled around a waterfall at low altitude but found little of interest. We then moved to a higher south-flowing rivulet cutting deep into the base of the Langeberg. The western slope seemed favourable, being rocky, moist



Fig. 2. *Erica ixanthera* under an overhanging rock on the slopes of the Langeberg.

and shaded from the afternoon sun. Because of the steep incline we had to move slowly and we decided to split up for a while to cover more ground. Then it happened! Under the overhanging rock I saw those white bells. On finding more of the same species I collected a couple of small samples so as not to harm the plants and hurried up the slope to Gerhard shouting "I've found something strange!"

"Me too!" he fired back, studying a twig of the same plant.

"Could this be *Erica ixanthera*?"

"It is possible. It looks like the damn thing."

"But why isn't it pink and round?"

"How the hell should I know?"

Only later did we figure out why we were quite wrong in supposing the form and colour that we had been looking for. The *Erica* expert George Bentham described the species in 1838 from Burchell's 24- year old specimen which had, by that time, faded, and Bentham therefore did not mention its colour. The only herbarium specimen of *E. ixanthera* in South Africa (Muir's collection) had also faded and nobody had taken the trouble of noting the form and colour while it was still fresh.



Fig. 3. *Erica ixanthera* in close-up.

We could not be sure of the plant's identity until we had compared it with the detailed description of *E. ixanthera* which I had left in Gerhard's car, having had so little hope of finding the "Real McCoy". We returned to his holiday home at Witsand and made the comparisons. There was little doubt that it was *E. ixanthera* but we were very wary of celebrating too soon, knowing the disappointment of "special" collections that turn out to be commonplace. Gerhard even appeared not excited at all. We still had to get the flowering parts under a microscope and, most important, Ted Oliver, the world authority on *Erica*, had to confirm the identification at Kirstenbosch.

We returned to the locality the next morning to take the photos, since the sun's low position in the eastern sky would provide better light under the overhanging krantzies where the plants grew. While Gerhard photographed, I looked around, having foolishly left my camera at home. It turned out to be a lucky oversight! As I passed under the same overhanging rock where I had searched the previous afternoon I spotted a small plant in the deep shade. It had minute funnel-shaped flowers and was growing from the roof of the cave. I interrupted my friend's camera work and asked him to identify the species.

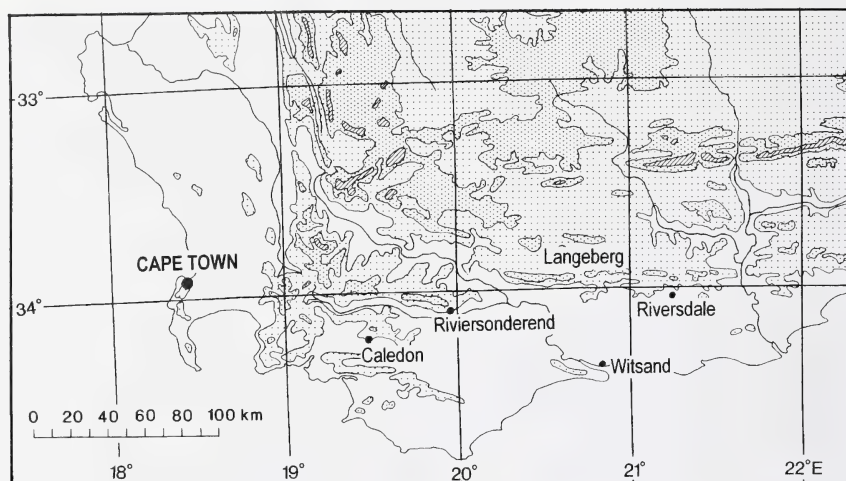


Fig. 4. The flowers of *Erica tenuicaulis* seen for the first time in living memory.

Studying it closely Gerhard remarked "I'm sure this is something out of the ordinary too. It is definitely an *Erica*, but which one?" For a moment I thought that maybe we had something brand new in hand and what a coincidence it would be – finding a new species alongside a long-lost old one!

It turned out not to be. Nevertheless we had managed to locate another record of Dr Muir's finds of 1908 and 1912, which had never before been pinpointed. We had found *E. tenuicaulis*, also described by Bentham and, before Muir, only found by the famous Rudolf Schlechter³ in 1844 in the Langeberg. So another Muir collection could be coupled with that of one of the other famous collectors of yesteryear.

Before leaving the area we checked that the plants were locally abundant and in no apparent danger. Our specimens were carefully stored in a moistened air-tight tube and, after a spell in the fridge, taken to Kirstenbosch by Gerhard two days later. He telephoned me that evening overjoyed with the news that Ted had indeed agreed with our identification of *E. ixanthera*.



The other one caused some head-scratching before Ted and his wife Inge (also an expert on *Erica*) could pinpoint it as *E. tenuicaulis*. The problem was caused by the difference in habit between the Riversdale colony and the others in the Riviersonderend mountains.

And so in the end our long quest was doubly rewarded on the same trip. Both these plants had not been located before by anyone alive today – and the experience of having the experts puzzled for some time was a highlight for us amateurs.

But, as is often the case, the joy is not so much in the catch as in the excitement of the chase. Having been caught up in the fascination of these delicate flowers we hope to continue rubbing shoulders with this amazing genus and to enjoy the best friendships imaginable that come along with it.

Notes

1. William John Burchell (1781–1863), a native of Fulham, London, was the son of a nurseryman and trained in the Royal Gardens, Kew; he arrived in Cape Town in 1810, and subsequently travelled widely, departing in 1815. *Erica curviflora* var. *burchellii* bears his name.
2. Dr John Muir (1874–1947), from Castle Douglas, Kirkcudbrightshire, was a graduate of the University of Edinburgh. He emigrated to South Africa in 1896, settling at Riversdale. *Erica muirii* commemorates him.
3. Friedrich Richard Rudolf Schlechter (1872–1925) was a Berliner, and a professional plant collector. He collected extensively in South Africa between 1891 and 1898; his brother Max (1874–1960) joined him in 1896. *Erica schlechteri* is named after F. R. R. Schlechter.

This article was originally published in *Veld & Flora*, the journal of the Botanical Society of South Africa, and is reprinted here by kind permission of the editor, the author and the photographer. Minor amendments have been made by the author. ECN.

Erica arborea – the pipe smoker's dream

DAPHNE EVERETT

The Bannut, BRINGSTY, Herefordshire, WR6 5TA.

The word *briar* in the context of briar pipes has nothing at all to do with rose briars or bramble bushes, it is actually a corruption of the French word for heather – *bruyère*. Back in the last century the French word *bruyère* became confused with the old English, *brere*, which meant any prickly or thorny bush and therefore, *la pipe bruyère*, became to us in Britain, the *briar* pipe.

Erica arborea has been grown as a garden plant in Britain since 1658 but, as it cannot tolerate very low temperatures, it rarely reaches tree-like proportions in our gardens. However, some years ago I was told by our President, David McClintock, that he had one growing in his sheltered garden in Kent which had reached 15 feet (c. 4.5m) in 20 years – maybe someone living in Devon or Cornwall can do even better. In the less-favoured areas of Britain however, we can grow the equally beautiful *Erica arborea* 'Alpina', which was discovered by the German nurseryman and plant collector, Georg Dieck. In 1892, at an altitude of some 4,500 feet (c. 1500m) in the mountains of Cuenca in central Spain, Dieck found some *Erica arborea* growing and flourishing and, being intrigued by these plants, which would not normally be expected to survive as such an altitude, he took cuttings back home to Germany to root. Having grown them on for a while in his nursery, he found that they did prove to be much hardier than the type and the plants were given the name *Erica arborea* 'Alpina' (*alpina* meaning 'of lofty mountains').

Erica arborea has the most extensive distribution of all *Erica* species, being found both north and south of the equator and, in the Atlantic islands, trees have been recorded growing up to 60 feet (c. 18m) in height. We did not see any which had reached that height when we visited Madeira recently, but it was certainly a wonderful sight to see the central mountains of that island covered with a vast forest of *E. arborea* (mixed with *E. scoparia*) and we have a delightful picture of our guide, Roy Lancaster, taking a photo-call perched up in the branches of a tree heather (Fig. 1. p. 12).

However, in the Mediterranean regions (where our story really belongs) *Erica arborea* is more usually a shrubby tree of around 15–20 ft (4.5–6m) in height and the tallest specimens grow where they are sheltered from the wind by the taller cork oaks or olive trees with which they associate naturally. They are found growing in anything from pure sand to solid rock and they can live to a great age.



Fig. 1 Roy Lancaster in a tree heather in Madeira

had noticed the carvings in his local villages which were made from woods obtained in the vicinity and, on his return, he asked one of the villagers if anyone could carve him a *bruyère* pipe. Wood carving, both in heather wood and box wood, had been carried out in his region of the Jura for some time, much of it at St Claude, where the inhabitants had been taught their craft by the local monks. The request to make a *bruyère* pipe was passed to the turners of St Claude and the results were so successful that, eventually, the carving of 'la pipe' became the main occupation of the place.

The second version of the story goes as follows: When pipe-smoking became fashionable towards the end of the eighteenth century, wood-turners in the Jura tried making pipes from local box, walnut, wild cherry and pear wood as cheaper alternatives to the expensive meerschaum. However, these burned with the tobacco and produced a rather bitter taste. In 1854, a pipe maker called Daniel David, living in a village close to St Claude, was told by a visiting Corsican that heather root (*la racine de bruyère*) was far superior to box wood for pipe making and undertook to supply him with the material. The pipe maker took up this offer and soon became so successful that he moved into St Claude and built up a large business and by 1865 the town had established a monopoly in the manufacture of briar pipes.

I understand that this latter version occurs in the town's tourist pamphlets and in the *Michelin guide to Jura Franche-Comté*, so perhaps might be considered as the definitive one.

The trees generally used for pipe manufacture these days are found in Mediterranean areas (Greece, Algeria, southern Italy, Corsica, Sardinia

I have received two versions of the story of how briar pipes came to be manufactured. In the first, some time in the last century, a French pipe manufacturer on a visit to Napoleon's birthplace in Ajaccio (Corsica), broke his expensive meerschaum pipe. A meerschaum pipe, as I have learnt, is carved from a soft rock-like clayey mineral, which is mined in, among other places, Turkey (a dictionary definition of meerschaum is 'hydrous silicate of magnesium found in soft white masses'). The pipe manufacturer



Fig. 2. Stages in the manufacture of a briar pipe (by courtesy of Peterson Pipes) and Sicily) where a hot, intensely dry summer follows a mild and showery winter. It is the effort to survive the summer droughts that cause the trees to develop the huge, close-grained and deeply penetrating roots which give them their special value.

Really good briar root is rare. The trees need to be at least 60 to 100 years old to produce a root of a suitable quality and the finest specimens have been growing for about 250 years. Unfortunately the areas where the best trees are to be found are also the most inaccessible and it is often necessary to travel many miles on foot, through dense scrubland, to reach them. In Sardinia, the briar root is transported for long distances, through rocky woodlands, using pannier baskets on the backs of mules. The quality of the soil is also important; some of the best and hardest roots are those which thrust their way deep into the rocky hillsides, making the harvesting of these roots a very arduous occupation. Not all the root that is collected is suitable for the purpose. Natural flaws, embedded stones and lesions caused by fires (which are a common occurrence) can all make the root unusable.

Usually, the pipe manufacturer, or the owner of the local sawmill, buys by auction (from the owner of the forest or from the government) the right to dig for briar for a period of years. The diggers are usually local small-holders, who are glad to earn a little extra money and who often know where the best trees are to be found. They have to be prepared, not only to

dig deeply into rock to unearth the huge root, but to cut it into manageable pieces. They also have to construct any tracks or bridges necessary for transportation.

The pieces of root are taken by the digger to a main collection point, often a considerable distance from where he has been working, and here they are stacked and covered with earth to stop them drying out, to await the arrival of the collecting foreman. The foreman inspects each piece of briar root and pays the digger according to the weight and quality of the root he has collected. From the collecting point a lorry takes the roots to a specially equipped sawmill, where they are stacked and covered, and kept constantly sprayed with water until the machine operators are ready to start work on them. They are then cut into roughly-shaped cubes, about the size of a large fist, which are called *ébauchons* and these will eventually form the bowls of expensive briar pipes.

At this stage, the wood is once again closely examined, as much apparently good root will be found to contain flaws and will have to be rejected. The *ébauchons* are then divided into four grades according to quality and boiled in water for 12 hours to kill the wood completely. The next operation is to season the wood. This is achieved by stacking the *ébauchons* in drying sheds for up to six months, after which time they are inspected once again for defects. At the end of this time they are put into sacks according to grade and are shipped all over the world; the best grades are usually sent to London.

It is said that the wastage in this whole operation is so great that root material from 60 tree heaths may be examined and rejected in order to produce the wood for one perfect pipe. It is no wonder that a perfect, unblemished briar pipe can cost up to £1,000; a small price I suppose for all the effort which has gone into its manufacture.

For those who may be worried about this cavalier treatment to so many tree heaths, I understand that the removal of a piece of the root is unlikely to kill a mature tree. However, one manufacturer wrote that “there has been a recent trend to early harvesting, which has proved both wasteful and uneconomical, and steps are now being taken by the appropriate authorities to put an end to this premature harvest”.

With the threat of Mediterranean summers coming to Britain, I find I am looking at the tree heaths in our garden in an entirely new light. I wonder ... !

Acknowledgements

My thanks are due to the following for helpful comments and advice:

David McClintock, Ron Clevely, Falcon Pipes Ltd, and Michael Butler of the Pipesmokers' Council. Also, to Alfred H. Dunhill for the interesting facts gleaned from his book *The gentle art of smoking*.

Calluna vulgaris 'Christmas Candle': its history by e-mail!

JOYCE DESCLOUX

32 Longridge Road, RANDOLF, NJ 07869, U.S.A.

I was surprised ... to receive your e-mail letter. Surprised that you had heard of 'Christmas Candle'

What can I tell you about 'Christmas Candle'? It is a sport of 'St Nick' which is itself a sport of (I think) 'Autumn Glow', that arose in the garden of Dorothy Metheny, Seattle, Washington, in the 1980s. I got a plant from Alice Knight, former proprietor of Heaths & Heathers Nursery about ten years ago. I sited it against the house foundation, facing southeast, where it gets almost full sun. At first 'St Nick' was a disappointment to me; it never bloomed. The plant produced good buds, but they failed to open here. It bloomed first on December 6 in Dorothy's garden, which is why she named it 'St Nick'. The climate in Seattle is a good deal warmer than New Jersey. I live about 40 miles west of New York City and by December we have winter weather by then which blasts the buds. One year it was mild until Christmas, and I cut some branches and brought them in, but the buds still failed to open. However, 'St Nick' is a very attractive foliage plant, fairly short, bushy and full, and the unopened buds give it a bluish cast from August on, which is unique. I came to treasure it for these qualities.

After I'd had 'St Nick' a few years, it had spread out to about a yard across. Several years ago we had a problem with carpenter ants and the exterminator sprayed an insecticide called Dursban around the perimeter of the foundation of the house. Several months later, or possibly the next spring, I noticed yellow and orange shoots coming up from the 'St Nick', at first mostly at the back of the plant nearest the wall, though later in the front, too. I expected they would revert back to green, but they didn't, and the plant continues to throw colored shoots. I made cuttings and sent some to Karla Lortz, Shelton, Washington, the current proprietor of Heaths & Heathers. I asked her to test the plants, but not to sell them, but this year [1999] she listed them in her catalog, which is on the Internet. I had also given cuttings to Dr Harry Bowen on Cape Cod a couple of years ago, asking him to evaluate the garden-worthiness of the plant. I didn't know whether it would revert, or whether it would fail to survive in different soils and

climates. Harry intends to bring some of the plants to the joint annual conference of The North American Heather Society and the North East Heather Society, September 16–18 1999, in Camden, Maine, and we'll try and get them into competent hands for testing.

When I sent cuttings to Karla and Harry, I realized I had to give them a name, and I came up with 'Christmas Candle', both because of its festive holiday coloring and as a continuation of the theme of 'St Nick'. So far I haven't seen any blooms on the new shoots, which I count a plus, since I think they would detract from the foliage, possibly clash with it. I do hope it proves worthy of registering. However, I really don't see the point of registering a new heather unless there is something unique about it. We have too many run-of-the-mill heathers as it is.

I've had a life-long affection for heathers, possibly because of my British background. They are very durable, beautiful and rewarding plants, I find. I have been growing them for 30-some years, first at a former garden near the Jersey Shore, where they were superb as they liked the sea air and sandy soil. Here, on a dry, rocky, wooded hillside, they were not easy to establish, but after several years (and many failures) I got them growing well. It took time to inoculate the soil with the micro-organisms they needed, which I did, I think, by mulching with pine bark.

I have been growing heathers in this garden since 1984. I've learned it takes about five years to bring a new heather bed to maturity in this soil and climate (USDA Zone 6) This summer we have had terrible heat and drought, the whole region declared a disaster area. But the heaths and heathers, unlike most plants, are taking it well. As of this writing, the Callunas and others are in bloom, a boon to bees and butterflies and also, especially, to me.

Yet another *Erica* hybrid: *E. x garforthensis*

DAVID McCLINTOCK

Bracken Hill, Platt, SEVENOAKS, Kent, TN15 8JH.

This hybrid has been made twice, once in Yorkshire and later in British Columbia. As long ago as 1983 Dr John Griffiths of Leeds crossed *Erica tetralix* 'Bartinney' with *E. manipuliflora* subsp. *manipuliflora* 'Aldeburgh'. Of the 15 seedlings, which were 'pretty much the same' he kept just one. This after 15 years annual pruning was about 30 inches (80cm) high. He found that it did not flower well, so it seemed to be of scientific interest only. Its scent had come from the pollen parent.

Later, independently and unaware of John's work, David Wilson of Chilliwack, British Columbia, crossed the same species, the clones being respectively 'Melbury White' and 'Korçula' (which is *E. manipuliflora* subsp. *anthura*). These crosses differ only in that they have more, larger and rather paler flowers, and the scent is weaker. I have specimens of these plants.

The name of this cross must reflect the fact that Dr Griffiths of Garforth, Leeds, was the first to make this cross hence:

Erica x garforthensis D. C. McClintock **hyb. nov.**

Erica tetralix x *E. manipuliflora*. *Hybrida nova artificialis. Frutex sterilis inter parentes intermedius ad 80cm altus. Foliis 3–4mm glabris; floribus racemis confertis ramosis; odoratis; sepalibus 1.5–1.8mm, lobis erecto-patentibus pubescentibus; corollis 3–6mm rubro-purpureis antheris inclusis, stigmatibus capitatis exsertis.*

TYPE: CULTIVATED: *E. tetralix* 'Bartinney' x *E. manipuliflora* 'Aldeburgh'. Garden at 9 Ashlea Close, Garforth, Leeds, September 1998, J. Griffiths (WSY holo.)

A sterile **shrub** of horticultural hybrid origin, intermediate between its parents, up to 80cm tall. **Flowers** in dense, branched racemes; scented; sepals 1.5–1.8mm, lobes erect-patent; **corolla** 3–6mm, red-purple; anthers included; stigma capitate, exserted.

David Wilson has two of his clones likely to be named after being grown on further, one with the name of his daughter (see pp 18-21 following).

John Griffiths and David Wilson gave essential help with this note and Professor William Stearn looked over the Latin description.



11 year old Tracy Wilson (left) standing alongside *Erica x garforthensis* 'Tracy Wilson' beside her left foot which can be seen in more detail (above).

New Canadian heathers

DAVID WILSON

Wilson's Nursery Ltd, 6605 Hopedale Road, CHILLIWACK, British Columbia, V2R 4L4, Canada.

I would like to provide more information regarding the seedlings of *Erica* x *garforthensis* (*E. tetralix* x *manipuliflora*) (see p. 17, this issue) that resulted as an intentional cross between the cultivars *E. tetralix* 'Melbury White' x *E. manipuliflora* 'Korçula'.

When David Small visited our nursery in August 1998 he was quite delighted by the appearance of the nine seedlings, some of which were flowering for the first time. He took cuttings of eight; the ninth had suffered badly from drying out in the pot. He numbered them 1 through 8 according to his impressions at the time, with #1 being a floriferous, compact plant that he liked very much, and #8 being a compact bun of little value that has yet to flower. They were rooted at Denbeigh upon his return to England. I have maintained the same numbered tags with the plants and used the same numbers when I sent pressed specimens to David McClintock in late 1998.

In April of this year I was able to plant the nine seedlings in an open sunny position in our garden with the hope that they would grow well enough to evaluate and perhaps name one, so that a cultivar name could be reported with the first publication of the hybrid.

Our 1999 spring was very cold and wet and the plants appeared to show little top growth. In fact it was the first week of July before our weather turned warm. Plant #7, which had received some physical damage during a violent storm while still in a pot in the greenhouse, did not survive planting out. Meanwhile, plant #9 recovered slowly and has flowered later than the rest; it shows promise and may be one of the best. Plant #1 has been a little disappointing, being too compact and not 'showing' as well as others. Plants #2 and #3 are the most vigorous but David Small had cautioned me to consider only compact forms. Both have grown and flowered well. #2 is more rounded, 14 x 20 inches, with dirty pale pink, almost white flowers, and as of today (11 October 1999) are all a rusty brown. Plant #3 has attained a similar size but is slightly more upright with lavender-pink flowers, very much like *E. x williamsii* 'David Coombe'.

It has, however, continued to flower and even though the first blooms have gone the same rusty brown, new blooms cover the top of the plant. Of the three remaining seedlings, #5 is very compact and very attractive. It is a globe of about 8 inches across, and took a long time to cover itself with flowers in short fat clusters of pale pink, almost white flowers. Plant #6 is a pale lavender pink similar to #3 in color, loosely compact and of little value.

This leaves only #4 to describe and I believe I have saved the best for last. It has grown solidly to 9 inches high and 14 inches across and has been a mass of flowers for nearly three months. There is a hint of pale pink in the bloom as they age, but generally they appear white. The lower branches are somewhat ascending and it has bright green foliage. The blooms like most of the others have not been troubled by heat or poor weather, though some of the early flowers have gone the same rusty brown as the sister plants. I believe that if I could only have one of these seedlings in my garden it would be #4.

As regards naming one of these clones I must relate that in a letter to David McClintock earlier this year I suggested using the name of our youngest daughter Tracy. This delightful little plant has been a real treat to watch grow and flower, and naturally as she got wind of the possibility of having a plant named after her, and has watched them with me, I easily associate the two of them together.

Therefore, I would like to use her full name – #4 thus becomes *E. x garforthensis* 'Tracy Wilson'.

Some thoughts on selecting a new cultivar

I have developed an obsessive behavior when it comes to observing my seedlings. At critical stages of their development I will look at them a number of times during the day with the aid of magnification. The seedling, from germination to just after the first branching, can provide many hints as to the eventual size, structure, habit, foliage color, and, of course, identity of the plant. For example, from a batch of 1,200 *E. carnea* 'Porter's Red' seedlings, I was able to pick out every one that showed more promise than the norm by the time they were not more than 1 inch (3cm) tall. I still have 17 of the 23 I picked out on trial, the balance all 1177 grew into typical sprawly mauve pink, uninteresting *E. carnea*. This selection process was not possible with the same number of *E. x stuartii* seedlings – they all looked interesting as young seedlings!

Another critical time for observation is flowering stage when I again begin to study the plants very closely. Just now I am watching some *E. carnea* 'Golden Starlet' x *E. erigena* 'Brian Proudley' seedlings. I have been watching where the buds form on the stem, and what shape and arrangement the buds take. The color of the pedicel provides a major clue as to the ultimate flower color. I study the sepals, color and any change of color, length, shape, and at what stage and color the corolla emerges. I watch the corolla expand and lengthen and watch the color change until the style and anthers emerge. I have become very well acquainted with individual flowers and followed their existence for many months.

This kind of behavior is not necessary to trial a few plants and even though these nine *E. tetralix* x *manipuliflora* seedlings were subjected to the same embarrassments the selection process was based on simply getting them in the ground and watching them grow. I selected a position in the garden that I thought favorable; sunny, open, and off the main track so they wouldn't run the risk of being stepped on. The soil prepared as well as I could and the same conditions given to all nine plants. Growth rate and habit as well as foliage color, from new growing tips to mature leaves, were observed. At what stage flowering began was noted, and the rate at which the blooms opened. Flowers were carefully checked for damage after poor weather, heavy rains, or extreme heat, even after watering in very hot weather (we had two short very hot spells this summer). When the plants were well in bloom I studied them at different distances, under different light conditions and from different angles, comparing them to others in their group, and to the colors of other heathers that were flowering nearby. I noted when and at what rate the flowers faded and am still at that stage now. I took advantage of interested visitors, and family to give me their impressions of the plants.

The other steps that need to be taken, but that have not been done in the case of the *E. x garforthensis* seedlings, are to test hardiness and durability under more difficult growing conditions, as well as the ease or difficulty of propagation. Though we may say, in this case, that as David Small was able to root them, at least it has been done once! For me, as a nurseryman, a most critical text would be to put a rooted cutting in a pot in March and see how long it would take to make a saleable plant, and then see if anyone would buy it!

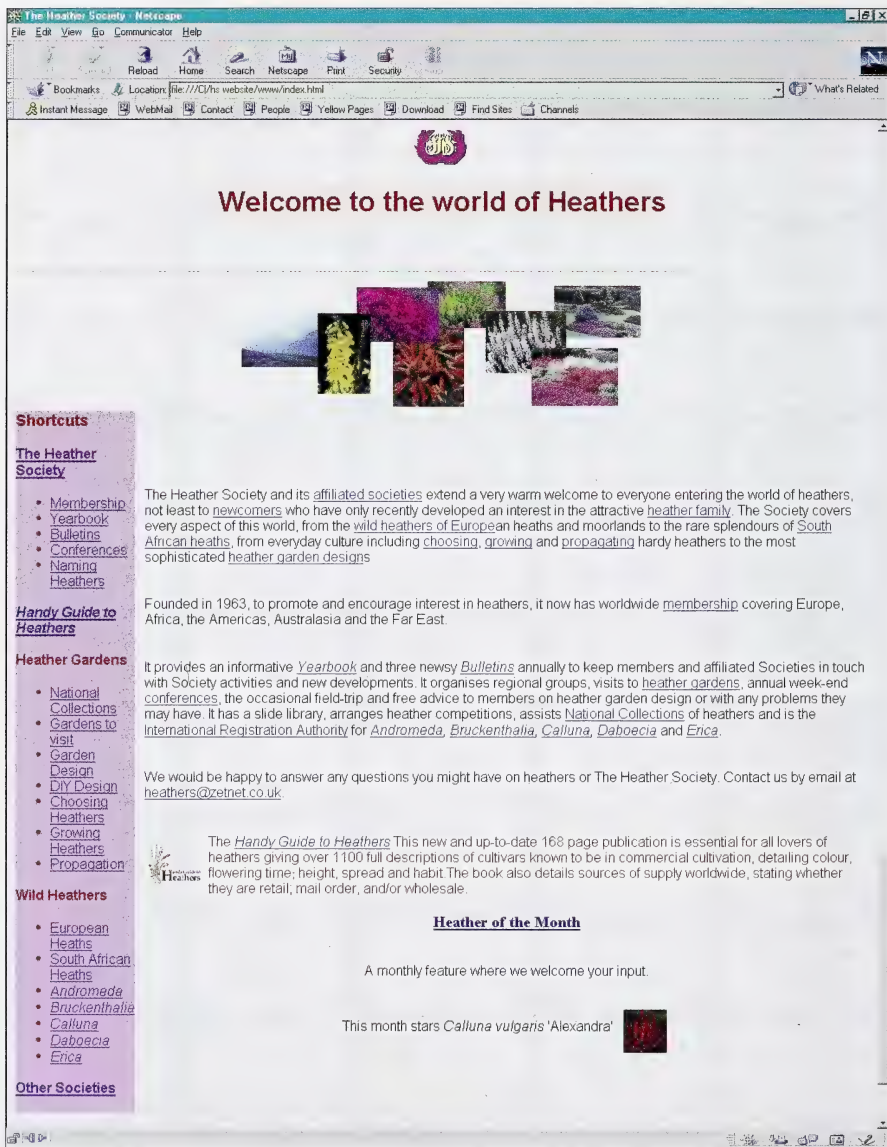


Fig. 1. Upon arriving at The Heather Society website, 'surfers' are greeted with this opening page. Links to other pages are underlined in blue whilst regular users of the site normally use the shortcuts bar which has a heather-coloured background.

Heathers on the Internet

DAVID SMALL

Denbeigh, All Saints Road, CREETING ST. MARY, Ipswich, Suffolk, IP6 8PJ.

The Internet affects all of our lives nowadays even if it is only as some unintelligible address at the bottom of TV advertisements and programmes. Even our much beloved heathers feature prominently, but before detailing how, I should provide a few words on the Internet for those who are unfamiliar with this ethereal world.

The **Internet** is a vast network of large computers throughout the world connected to each other by high speed telephone lines. Residing on these computers is a vast amount of information, located on **websites**. It is the **address** of these websites – e.g. <http://www.users.zetnet.co.uk/heather/> – that are seen in advertisements at the end of TV programmes. Websites can be found on any subject you care to think of, many of which are kept constantly up-to-date making them more valuable than an outdated encyclopaedia. To access this information you need a computer, a telephone line, a modem, which is a small box which connects the two, and an **Internet Service Provider** (ISP). The latter is a company that provides a gateway to the Internet and often provides a website for your own use.

Use of the Internet is not too expensive. The ISP usually makes a small monthly or annual charge for providing the service (many are now free) and the telephone call is usually charged at the local call rate, irrespective of where in the world the website maybe.

The website information is displayed on the monitor of your computer by means of a **browser** which is software usually already installed on multimedia computers when they are purchased. Websites can include moving pictures, animations and sound to make the site more interesting.

Once on the Internet, the use of a **search engine** will gain you access to any information you desire by entering a few key words. Entering the single word “heather” will give you thousands of websites, most will have nothing to do with plants as it is a popular girl’s name! So to narrow the search, it is far better to enter several words such as “heather” + “society” or even a cultivar name! By the way, entering “heathers” is equally useless as there is a cult film called *The Heathers* and there are hundreds of web sites about it.

There are innumerable websites that mention heathers in passing but there are several which specifically cater for heathers. The most comprehensive site is our own one which also provides “links” (shortcuts) to other websites (see Fig. 1).

On our site we try to provide information, presented in a friendly way, so “surfers” (people who are searching the Internet) are sufficiently interested to read on. Of course, our long term aim is to get them growing heathers and to join The Heather Society!

Our website is divided into **pages**, each dealing with a different topic of growing heathers. We have a “Heather of the Month” feature where we provide full information about, and a picture of, a particular cultivar. There are pages on South African heaths, details on the latest *Bulletin* and *Yearbook*, propagation, heather garden design and much, much more.

We are able to keep a check on which pages are visited most frequently, and by far the most popular page is the Internet version of the *Handy guide to heathers*. This is similar to the book but only lists cultivars from nurseries who subscribe to the website. It contains over 100 pictures many more than we are able to put in the book. Perhaps the most novel feature is that you are able to search the *Handy guide* to select heathers meeting certain criteria, for example, those having double white flowers with coloured foliage, or those flowering in August that grow no higher than 10cm.

We have also added a do-it-yourself heather garden design programme which will allow you to choose your cultivars from the *Handy guide to heathers*, plant them in your garden in any design arrangement and view them in 3D at any time of year. Beats weeding.

INTERESTING (REAL HEATHER) WEB SITES

The Heather Society:

<http://www.users.zetnet.co.uk/heather>

The North American Heather Society:

<http://www.humboldt1.com/~heathers>

Royal Horticultural Society:

<http://www.rhs.org.uk>

Kirstenbosch Botanical Gardens:

<http://www.nbi.ac.za/>

Heaths and Heathers, Washington, USA:

<http://heathsandheathers.com>

Rock Spray Inc. Massachusetts, USA:

<http://rockspray.com>

Viking ale and the quest for the impossible: some marginalia leading, perhaps, to 'the most powerfulest drink ever known'.

E. CHARLES NELSON

Tippitiwitchet Cottage, Hall Road, OUTWELL, Wisbech, Norfolk, PE14 8PE.

Fíon Spáinneach, mil Gréigeach agar beoir Lochlannach: sin iad na trí deochanna is milse agus is dea-bhlasta dár ól duine riamh.

Spanish wine, Greek honey and Viking beer: the three sweetest and tastiest beverages anyone ever drank.

It is interesting, nevertheless, to note how the dreams and expectations laid down in popular tales, whether containing a foundation of reality or not, can actually be a constant incitement to practical endeavours and even lead to useful discoveries.

BO ALMQVIST: 'The Viking Ale and The Rhine Gold'.

In *The Tailor and Ansty* by Eric Cross, a famous book deservedly described as a modern Irish classic, 'all human life' is paraded. This remarkable book is a wonderful evocation of a lost age, of an isolated townland in the mountains of County Cork, of one man, 'The Tailor', and of his wife, Anastasia ('Ansty'). It is not fiction. Yet the book was banned by the Irish Censorship Board in 1942 as being 'in its general tendency indecent'. The ban was debated in the Irish Senate, that 'prize collection of half-wits' (to quote Frank O'Connor) – but that is another story.

The Tailor and Ansty lived in a remote glen in west Cork in the far southwest of Ireland. Before 'The Emergency' (the Irish euphemism for the Second World War), a Danish girl, known to The Tailor as Kissten, came to that glen. She was, at first, quiet and The Tailor was

not impressed favourably by her. ... But then he came to know "Kissten" and to like her, and he recanted. He discovered a lot in common with her. "After all, weren't the Danes in Ireland for hundreds of years? Didn't they leave the grouse, which was their hen, behind them, and the weasel, which was their cat, and the hedgehog, which was their pig? Didn't we teach them all about pig farming and dairy farming, so that they have come to be the best farmers in the world today?"

There was one thing he could not get from “Kissten”. It was the formula for “the Danes’ drink”, made from the heather. “Kissten” had not even heard about it, but the Tailor suspected that she knew but would not tell. For the last two men who had the secret in Ireland went to their deaths rather than disclose it. “... That must have been one of the most powerful drinks that have ever been in the world, and I’d like to try a sup of that before I die.”

That is not the only reference to the Danes’ drink in *The Tailor and Ansty*. The Tailor and his friend, ‘Cork Echo’ – everyone has a moniker! – were talking one night about the plans of Tady Joe to dig up a monolith (a gallaun) which was on his land. Cork Echo was prompted to tell The Tailor about an Englishman, ‘who had no religion at all’ and who dug up a gallaun and (so the tale went) found the body of a giant underneath.

“... And there was a bottle beside him [the giant], and on it there was a notice printed, ‘Give me three drops from the bottle’.”

“Well, and did they give him the drops?” [asked The Tailor].

“They did not. They buried him up again – quick. Do you know that the Englishman died the following year?”

“Am bostha! You wouldn’t expect him to live for ever, I suppose! Did they carry the bottle?”

“They did not. They covered it all up again.”

“The more fools they. They had a right to carry the bottle. Do you know what that was? [The Tailor was now in full flight.] Like as not it was the ‘Danes’ drink’, made from the honey of the heather. It was the most powerfulest drink ever known. Yerra, talk about your whiskey and your ‘first run’. They were only walking after it. Do you know that one drop of that would keep a man young for a year? Doesn’t it stand to reason if three drops would bring a giant back to like again? Thon amon dieul! What great fools they were, and all because of an old stone, and a lot of old nonsense, and the talk of ignorant people. ...”

THE FOLKTALES

I have had on my bookshelves for several years a volume bearing the title *Viking ale. Studies on folklore contacts between the Northern and the Western worlds*. When I was packing my books to move to Norfolk in December 1995, the title suddenly struck me as familiar and I realized that Danes’ drink and Viking ale were one and the same thing. I opened it and wasn’t disappointed.

In the chapter headed ‘The Viking Ale and the Rhine Gold. Some notes on an Irish-Scottish folk legend and a Germanic hero-tale motif’, Professor Bo Almqvist recounts a visit to Dunquin, at the tip of the Dingle Peninsula in County Kerry, not that far from west Cork as a seagull flies. There, during 1957, Almqvist met Mícheál Ó Gaoithín, who, like his mother Peig Sayers, had

‘developed conversation into a fine art.’ In return for his conversations, Almqvist

now and then bought him a bottle or two [of beer] from the local pub. One day [Mícheál Ó Gaoithín] happened to mention that he had once tasted an especially good beer, which had been offered him by some Danes who had visited the parish. As a friend of mine [Almqvist] was about to come down from Dublin, I wrote to him and asked him to bring along a few bottles of Carlsberg, as I surmised that that would have been what Mícheál had had. Mícheál was very pleasantly surprised when he got the gift and after tasting it he remarked with a smile. ‘That’s a true Viking beer’ (*Fíor-bheoir lochlannach is ea é san*). I took this to be a pun and thought that Mícheál referred to the beer’s being Danish as well as to my own nickname in the parish – I was, as I have to admit for the sake of the story, called *An Lochlannach* (‘The Viking’). And in fact it was a pun, but there was more to it than I had suspected.

Ó Gaoithín asked Almqvist if he ‘had’ the story about the Viking beer, and when he discovered that *An Lochlannach*, ‘The Viking’, didn’t know it, he proceeded to tell this version.

A long time ago the Irish had killed off all the Vikings except for an old man and his son. In the end these two were captured, but the Irish offered to spare their lives on condition that they told them how to make beer out of heather. The beer had a wonderful taste and it was only the Vikings who knew how to make it. ‘Kill my son first’, the old man whispered to his guards, ‘I am ashamed to speak in his presence.’ The son was then thrown over a cliff. When the old Viking saw this he laughed. ‘Now’, said he, ‘I am the only one who knows the secret; you may kill me, I will never tell it to you.’ So they killed the old Viking, and that is why the Irish never learnt to make heather ale.

Mícheál Ó Gaoithín ended by quipping that ‘perhaps they still know how to make it in Denmark’.

Almqvist admits he was overawed by Mícheál’s story, and later discovered that it was very common both in Ireland and Scotland ‘from the Shetlands to the Mull of Galloway’. He also immediately thought of the tale of the Rhine gold, a story told in the Old Norse Eddis lay *Atlakviða* and perhaps best known as the final part of the German *Nibelungenlied*. Almqvist magnanimously points out that he is not the first to make this connection. Perhaps, as some scholars have suggested, these tales derive from a Celtic original – but the origins of the tale are not of significance here, and in any case Almqvist eventually rejects this theory.

In the Scottish version of the tale of heather ale, *leann fraoch*, the two Vikings are replaced by the last two surviving Picts, and so the ale is also called Pictish ale. Thus, so the story goes, the art of making heather ale also died out in Scotland when the Picts were exterminated, 'for they shew nevir the craft of the making of this drink bot to thair awin blud.'

What is of more interest is Almqvist's discussion of the significance of this type of story, a tradition 'inciting to action and experiment'. He quoted an Irish saying concerning the hard-hearted Norseman: 'It was a great sin of them to take away the secret of so good a drink. For what good could it do them and they dead?' And, Almqvist mused, how many men over how many generations have tried to recover the secret of brewing the Vikings' ale?

I won't attempt to answer that question, except by surmising that countless people have tried. At least they had a start, for the tales told that the ale was brewed from *fraoch*, heather, most usually from the tips or the flowers, rarely from the roots. In some parts of Ireland, ling or common heather (*Calluna vulgaris* – Almqvist used the old name *Erica vulgaris*) was actually called *fraoch lochlannach*, Viking heather. Almqvist further reminds us that actual recipes exist.

RECIPES FOR MAKING HEATHER ALE

From time to time recipes for heather ale, for the legendary Pictish or Danish or Viking beer, have been printed, and these variant recipes and the folktales suggest heather ale was a sweet drink.

Vickery (1995) quoted one from A. S. Fraser, *The hills are home* (1973). Fraser obtained this recipe from a Mrs Leys of Ballater in Aberdeenshire – she 'knew all about heather ale, the popular home brew of olden times.' It was made, according to Mrs Leys, when the heather was 'at its best' in August and September

They filled a large pan with the purple flowers, covered them with water and boiled them for an hour. This was strained into a large wash-tub, and ginger, hops, and golden syrup were added. Again the mixture was boiled and strained, and yeast was added when the mixture cooled, The liquid after a few days was gently poured off, leaving the barm at the bottom of the tub.

Almqvist quoted the oft-quoted one that Marian MacNeill reprinted in *The Scots kitchen* (first published in 1929) from an 'old coverless book of cottage cookery', which includes the croppings of heather, syrup and ginger; this recipe was reprinted in the first *Yearbook of The Heather Society* (Chapple 1963), and has also been repeated elsewhere (e.g. Kucinski 1991). In fact this is the same recipe as Mrs Leys' one, but more precise in its quantities.

Crop the heather when it is in full bloom, enough to fill a large pot. Fill the pot, cover the croppings with water, set to boil, and boil for one hour. Strain into a clean cloth. Measure the liquid, and for every dozen bottles add 1oz. of ground ginger, ½oz of hops, and 1lb. of golden syrup. Set to boil again and boil for 20 minutes. Strain into a clean cloth. Let it stand until milk-warm, then add a tea-cupful of good barm. Cover with a coarse cloth and let it stand till next day. Skim carefully and pour the liquor gently into a tub so that the barm may be left at the bottom of the cask. Bottle and cork tightly. The ale will be ready for use in two or three days.

So the heather was there for little more than extra flavouring, given that hops, yeast, ginger and a vast amount of golden syrup were added.

The syrup and the ginger, of course, reveal that this recipe is not particularly old. It is interesting, nevertheless, to note how the dreams and expectations laid down in popular tales, whether containing a foundation of reality or not, can actually be a constant incitement to practical endeavours and even lead to useful discoveries. (Almqvist 1991:71)

But were the experimental brews drinkable? One mid-nineteenth century report from Ireland suggested that they were undrinkable: 'it is an insipid and extremely thin potation, and as little dangerous to the head, as salubrious to the stomach' (Locke 1859). MacLagan (1901) tried the various recipes, with disappointing results, until he collaborated with a brewer when he managed, using heather tops, to produce a beer that was still unpleasant to the taste and did not keep. Subsequently he offered to subscribe five pounds to 'any antiliquor combination' if someone would send him heather from 'Caithness, or any other district in Scotland, picked under guarantee of purity ... capable of alcoholic fermentation.'

HEATHER ALE FOR THE POOR MAN

Almqvist's explanatory notes are a mine of invaluable information about the folklore of heather ale, and about its history. He quoted from *Sundrie neue and artificial remedies against famine*, published in London in 1596:

A cheape liquor for poore men when malt is extream deare: If a poore man in the time of flowering doe gather the toppes of heath, with the flowers which is usually called and knowne by the name of Ling in the northerlie parts of this realme, and lay up sufficient store thereof for his own provision, it being well dried and carefully kept from putriefying or moulding, he may at all times make a very pleasing and cheape drink for himself by boiling the same in fair water with such proportion thereof as may best content his own taste.

Hardly an ale, more a tea (see Johansson 1989; Walker 1990)!

WAS HEATHER ALE EVER MADE?

There can be no answer to this question. If I am not misreading Professor Almquist's paper, originally presented at the Fifth Viking Conference in Tórshavn in July 1965, the legend may have incited people to attempt to make an alcoholic beverage using heather. But it is clear from the recipes that heather was not – indeed it could never be – the main ingredient (see e.g. Mackay 1995, 1996). A source of sugar was necessary because the heather flowers themselves actually contain only minute amounts of sugar, giving a very dilute solution when they are steeped in large quantities of water (see e.g. Walker 1990, 1994).

Did the Vikings use heather to brew ale? Robinson (1994) noted that archaeological evidence demonstrated that the Danish Vikings used hops and bog myrtle (*Myrica gale*) in brewing; the latter is still used to make gale beer but this is not the stuff of legends (see Appendix for a recipe for heather beer including bog myrtle). There is no mention of heather, nor of honey.

Various authors (e.g. Williams 1995, McGrail 1996) vaguely refer to Neolithic pottery excavated on the Scottish island of Rhum having 'traces of fermented beverage containing [*sic.*] heather.' But is this evidence of the use of actual pieces of heather?¹ Accounts of the Picts making an alcoholic beverage from heather are generally traced back to the early Scottish historian, Hector Boece (Boethius) (c. 1465–1536) of Dundee, who wrote

Florem enim fert mense Iulio purpurei coloris mellisissimus: unde Picti olim potus genus conficere solebant ...

which entire passage a contemporary, Dr John Bellenden (*fl.* 1533–1587) (quoted by Wallace 1903: 92–93), rendered as

This herbe ... namit hadder ... in the moneth of July has ane floure of purpure hew, also sweit as huny. The Pichtis maid of this herbe, sum time, ane richt delicius and hailsum drink. Noctheless, the maner of the making of it is perist, be exterminioun of the said Pichtis out of Scotland; for they schew nevir the craft of making this drink bot to thair ain blud.

One interesting point, not discussed by any of the sources I have looked

¹ Prof. Jim Dickson, Department of Botany, University of Glasgow, an expert of prehistoric plant uses, commented (*pers. comm.*) that he is not convinced that there is any evidence that heather was used in Scotland during prehistoric times to make beer.

at, is the possibility of using honey predominantly made from *Calluna* (or *Erica*) nectar, as a major source of sugar for brewing an alcoholic drink – it would be interesting to know if heather-honey mead was made in Scotland or Ireland (see e.g. Walker 1990a; Mackay 1994). It surely would have been a better, more pleasant and more potent drink than anything brewed from heather tops. Moreover this would account for the sweetness of the legendary Viking ale. And that brings us back to *The Tailor and Ansty*, for The Tailor himself said that “Like as not it was the ‘Danes’ drink’, made from the honey of the heather. It was the most powerfulest drink ever known.”

The ‘Danes’ drink’ seems to have been a powerful myth in southwestern Ireland, as demonstrated by this extraordinary account of an antique brass basin:

A farmer in Co. Kerry ... who recently found an old metal basin on his land has now been told by the National Museum [of Ireland, Dublin] that it is a beaten brass basin dating back to the 16th or 17th century. The vessel is 28" in diameter, weighs just over a stone [14 lbs], and is thought to have been used for brewing a drink from heather, an old tradition in the area. There are a number of fields fenced-in on the mountain at Cloon East, Glencar, where a particularly sweet strain of heather grows. The farmer, Maurice Breen, remembers his father speaking of people who used to make drink from it. [Hayden 1984].

Recent beverages claiming to be made with heather include the liqueur Irish Mist and the Scottish beer called Fraoch. One advertisement for the former reads: ‘Experience the world’s most luxurious liqueur. At first sip, the taste is smooth and distinctive, a classic marriage of heather and honey, exotic herbs and mellow Irish spirits...’. Irish Mist is also advertised as a ‘legendary liqueur’ made from a recipe ‘over 1,000 years old’. Fraoch, the modern heather ale brewed in Scotland, is made using a recipe that a Gaelic-speaking islander translated for Bruce Williams (1995; see also McGrail 1996): ‘... I tried and tried again before successfully reviving *leann fraoch*’ he admitted, but now it is a cult drink.

Finally, Almqvist makes one more telling point. The Irish word *beoir* and the English equivalent, *beer*, are loan-words from the Vikings. The Irish and Gaelic-speaking Scots had native words for beer; the Irish ones are *cuirm* and *linn*; *leann* is the Scottish word. *Beoir*, which first appeared in Middle Irish, is cognate with the Old Norse *bjórr*. Almqvist posed this question: ‘Now if there are well-established names for a product, why should more be brought in, unless there is something different and remarkable about the

article or the country whence the names are derived?' The Irish did not normally borrow words, but they did borrow *bjórr*, and this, as Almqvist points out, is 'the very word that is almost universally used in the folk variants of the tale' about the Viking ale. And so he concludes: 'I prefer to think that the legend about *an bheoir lochlannach* travelled the same way as *an bheoir*, which the Vikings brought.'

"It was the most powerfulest drink ever known."

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APPENDIX: Heather Ale

The following recipe for heather ale featured in an edition of the Channel 4 programme 'A Cook On The Wild Side', and the recipe was published in the C4 WWW page and copied elsewhere too.

Wild Heather Ale (makes 30 pints)

Ingredients

2.5kg milled pale malted barley
 250 g milled crystal malt
 cold water
 small pieces of fat (animal or vegetable)
 8 large handfuls heather flowers
 2 handful bog myrtle leaves
 2 teaspoons baker's yeast or beer yeast
 1 level teaspoon sugar or honey per 750ml bottle

Method: Put the milled pale malted barley and crystal malt into a 3 gallon jam or jelly pan. Mix with cold water, then add more water to cover grain and stir into a slack, sloppy mixture. Heat very slowly, over 3 hours, until warm. Do not allow the temperature to go above 70°C – the use of a small piece of fat (animal or vegetable) will indicate the temperature: solid = cold, runny = warm, small beads = too hot. If it gets too hot remove from heat and mix until cooler. Mix every half hour, removing the fat with a spoon each time whilst mixing. Peg a coarse dishcloth over a second pan or bucket and strain out liquor, rinse the grains with several kettles of hot water and leave to drain. Boil this liquid for one hour with 5 handfuls of heather flowers and 1 handful of bog myrtle leaves. Rinse the dishcloth and peg over the fermentation bucket, place 3 handfuls of heather and 1 of bog myrtle in the cloth and then pour the hot liquor over this into the bucket, make up the bucket to 30 pints with cold water and leave to cool to body temperature. Add 2 teaspoons of baker's yeast or a sachet of beer yeast and leave for 6–8 days to ferment. (Adding more wild heather flowers will ferment the ale but the flavour will be more sour and wine-like.) Once the ale has stopped fizzing pour it into returnable strong screw top lemonade or beer bottles (750ml). Add one level teaspoon of sugar or honey to each bottle, replace top and store in a cool place until clear.



Bell heather, *Erica cinerea*

Arthur 'Harry' (Henry) Church (1865–1935), who was Lecturer and Reader in Botany at Oxford (1903–1930), prepared a series of marvellous illustrations to demonstrate floral biology to his classes. The original paintings are now in the Department of Botany, Natural History Museum, London. He eventually published a selection of 100 in his *Types of floral mechanism* (Oxford, Clarendon Press, 1908)

All the plants illustrated were easy to cultivate, and it is not surprising that among his splendid and extremely detailed, greatly enlarged, diagrammatic drawings are several of the flowers of heathers: *Erica carnea*, *E. cinerea* (illustrated here) and *Calluna vulgaris* (front cover).

Church observed that only humble-bees and Lepidoptera with proboscises 6–7 mm long could get at the nectar at the base of the flowers of *E. cinerea*. Hive-bees were practically excluded by the very narrow corolla mouth, but he noted that the flowers are 'bored to an enormous extent by the Hive-bee; often every flower over wide tracts may be found bitten through.' The hive-bees are virtual "robbers", avoiding the anthers and thus not serving as effective pollinators.

As for the flowers themselves, Church noted that this species produces dusty pollen, and the anthers, aggregated as they are around the style, form an effective sprinkling mechanism. The awns, spreading from the base of each anther, 'grow to touch the corolla and thus constitute a delicate trigger-mechanism.' When an insect inserts its proboscis, seeking to sip the nectar at the base of the flower, it touches this trigger-mechanism causing pollen to shake from the anthers.

E. C. NELSON

Heather follies of 1861

JUDITH WIKSTEN

9 Tispaquin Street, MIDDLEBORO, MA 02346-3337, U.S.A.

Nearly 140 years ago this summer a small kerfuffle erupted in the comfortable circles of American horticulture centered on Boston, Massachusetts. What rippled that placid pool was a pot of *Calluna vulgaris*, from which a grand theory briefly floated, an important man was embarrassed, and little chuckles of ridicule still echo through time. Here is the story of a young man who went courting a country girl, and of what happened at the Massachusetts Horticultural Society as a result.

"Mass Hort", as it is familiarly known, used to have weekly exhibitions at its Horticultural Hall, much like the Royal Horticultural Society of London, and its Flower Committee awarded handsome "premiums and gratuities" in various categories, including Ericas. These, as far as I can divine, were conservatory exotics of the tender South African species. Outdoor heather gardening was evidently not much done in Boston's harsh winter climate (USDA zone 6: -10° to 0° F; -23° to -17° C.)

All that changed on Saturday 13 July 1861 when a young professional gardener by the name of Jackson Dawson of Cambridge walked through the doors with a plant labeled "Native Heath, found growing within 20 miles of Boston". It created quite a stir, as recorded in the archives:

The plant was exhibited in a pot, and was apparently about six to ten years old, about half a foot in diameter, and the same in height; it was in full bloom, though the flowers were white rather than pink, caused by its having been kept from the light to prevent its drooping or dying from being transplanted at such an unfavorable season.

The chairman of the Flower Committee, Edward S. Rand, Jr., at once brought the plant to the attention of his colleagues, and called a special meeting to examine the matter. They correctly identified the specimen as *Calluna vulgaris*, known as "The Scotch Heather" in those days, but the assertion of its growing wild within 20 miles of Boston was naturally met with skepticism.

A scholarly squabble broke out. On the one side, botanists knew that although many members of the family Ericaceae are indigenous to North

America (notably *Andromeda*, *Cassandra*, *Epigaea*, *Cassiope* and *Arctostaphylos*) *Calluna* was definitely not among them. The conventional wisdom was that *Calluna vulgaris* belonged to Europe alone, and perhaps northern Asia, if you count Siberia. Young Jack Dawson and his so-called native Scotch Heather represented a shoddy attempt to deceive and mislead the Committee, they said. On the other side, those with inquiring minds – led by the chairman himself – wanted to find out more, and perhaps even imagined themselves on the edge of a major botanical discovery.

Of course the explorers won out, and the chase was on: bring in the wild heather! The Committee sent a note to Jack Dawson asking him to lead an expedition to the mysterious site itself. Here the plot thickens, as the Committee received no reply. More than a week passed, and the archives reflect that the gentlemen of the Mass Hort were mightily miffed. In fact they voted to drop the whole matter like a “hot potato”. Perhaps unfortunately, unfortunately, the chairman picked up the “potato” again



Fig. 1. Mr Jackson Dawson

when, after another day or two, Mr Dawson called on him and explained his predicament: his boss had told him to butt out. "It appeared the nurseryman in whose employ he (Dawson) chanced at the time to be, had forbidden his communicating with the Committee, or conducting them to the spot, at the same time endeavoring himself to find out the habitat, trusting thus, doubtless, by throwing every obstacle in the way of the Committee, to avail himself of the whole merit of the discovery, and doubtless reap pecuniary advantage by securing the whole stock of the plant. It was also attempted at the exhibition of the Society to suppress Mr. Dawson's name, his employer substituting his own," Rand wrote in his annual report. "The conduct of this person in thus attempting to control for private ends the scientific investigations of a Society of which he was himself a member, cannot be too strongly reprobated," he thundered. The greedy nurseryman's name is not recorded, but it surely must have fueled some gossip and earned the chairman an enemy.

Having cleared up the true reason for Mr Dawson's shyness, the Committee declared him "perfectly upright and straightforward", and promptly awarded the young gardener a silver medal and \$10, a generous sum that converts to \$200, or £125 by today's standards.

On the morning of Monday 5 August 1861 the seven-man Committee led by young Dawson "took the cars" for Tewksbury, a farming community northwest of Boston, near the old mill city of Lowell. I'll let Mr Rand tell you what they saw:

The locality of the Heather is about half a mile from the State Almshouse, on the farm of Mr. Charles H. Thwing. Leaving the Almshouse on our right, the Committee took a narrow sandy road, and in a short time came near the field; a short walk brought them to the spot, turning into a lane on the left hand side of the road. The plants occur sprinkled over a surface of perhaps half an acre; there may be in all about twenty or more old plants, some, allowing for the slow growth of the plant, from ten to twenty years old, others much younger.

The surface of the ground is varied by little hummocks, and is covered with a short close grass, interspersed with numerous plants of *Kalmia angustifolia*, *Spiraea tomentosa*, *Andromeda calyculata*, *Azalea viscosa*, *Myrica gale*, &c. A rapid brook bounds one side of this field, its banks densely fringed with the common Alder (*Alnus incana*), of which plants are sparingly scattered over the whole field; in several cases the Heather was found overgrown and shaded by these shrubs. The common Cranberry (*Vaccinium macrocarpon*) occurs somewhat abundantly in the immediate vicinity of the Heather, usually most so in the depressions, while the Heather occurs on the hummocks. From

appearances, overflows of the brook are not of unfrequent occurrence, when the greater part of the field would be submerged, and as the field is surrounded by low ground and ditches, a moderate freshet would convert it into an island. At the time of the visit of the Committee, owing to the continued drought of the past summer, the whole field was parched, and the brook very low.

The soil is sandy peat, just that in which one would expect to find such a plant, and admirably adapted for the growth of *Ericas*. The Committee explored the stream on both sides for some distance, but a heavy rain coming on prevented a more satisfactory examination. They also searched for young plants, and found a multitude of seedlings from one to two years old, and a few somewhat larger. The plants were in full bloom, and presented a most pleasing sight.

Still, seeing was not believing, and the Committee remained unconvinced that the heather was indigenous. The question was, Whence did it come? Digging deeper, they dispatched a sub-committee and collected interviews with the neighbors. Suspiciously nearby lay the farm of a Scotsman, a Mr Strachan, who may have planted it in a fit of nostalgia for his native hills. But no, Mr Strachan denied having brought or sowed the seed, nor had he received any parcels from Scotland or done anything in any way by which he could have introduced the plant. Pressed further, he grew indignant and protested, "Wuld'na I hae been a fool, man, to sow it on another man's land, when my own, as good, would hae' grown it as well?"

The committee went back to the landowner, Mr Thwing, but it turned out that he had farmed the land only about three years. He had bought it from Caleb Livingston, who had retired to Lowell, and in whose family the land had been for as long as anybody could remember. Mr Livingston had a hard time figuring out what the Committee was talking about, but when he was handed a sprig of heather his memory came flooding back. He remembered some 50 years ago when he was a boy, helping his father plow up the field in question. They had great trouble plowing, he said, owing to large patches, "as big as a bushel basket" or larger of a strange, spreading plant which ran on the ground and had long, tough roots that caught the plow. After a great deal of trouble, they got a heavy, strong harrow and tore up the plants – which were very old, strong and tough – piled them in the hollows and covered them with deep soil. They then leveled and sowed the field with grass seed, and used the field for mowing ever since. Old Mr Livingston showed the heather sprig to his mother, and the ancient lady recognized the plant, told where it grew, said it had grown there for many

years and remembered the trouble it was to plow the field. He traveled to Tewksbury and, undirected, went to the spot where the heather grew.

The mystery of how the heather got there remained unsolved, but now Mr Rand stepped off the rock of empirical evidence into the thin air of speculation, plus a little math. If the plants he saw were, say, ten years old, and if the original plants were plowed up by the Livingstons 50 years before, in 1810, then how does one account for their survival during the intervening 40 years? The seeds could have remained viable, or a few low branches "escaped the scythe," he suggested. "The probability is, the plants have kept growing, more or less, ever since. ... Indeed it would have been strange if a farmer had noticed such a plant, unless its encroachment on his mowing, pasture or arable land, called his attention to it," he wrote.

As to the age of the Livingston era plants, Rand guessed they were more than a century old, which brings us back to 1700. The town of Tewksbury was incorporated in 1734, European settlers having arrived a few years before, and prior to that the land was a Native American Indian village called Wamesitt. (At this point I'm glad nobody whispered the word "Norseman" in Mr Rand's ear.) Now came the great leap of faith:

"We can only assert the probability that the plant existing at so early a date in such an unlikely, out-of-the-way place, was indigenous to the locality. From all the evidence adduced it seems more probable that this is an original locality of the heather, and that the plant is indigenous to the United States," he concluded.

"May not the Heather have once existed in profusion on this continent," he speculated, "and have gradually died out owing to some inexplicable, perhaps only slight, climatic changes? May not this be the last vestige of one of the last of what was once an American heath? And if the Heather exists in Nova Scotia and Newfoundland, may we not expect further discoveries of localities intermediate between those countries and the Heather-field in Tewksbury?

"Every few years botanists are startled by the discovery, in what were considered well-gleaned localities, of new or very rare plants; and we are forced to the conclusion that the botany even of New England and the Canadas is not yet wholly known. The importance of this discovery we cannot well estimate. It is, as it were, a landmark in botany, and connects us by another floral link with the mother country," he wrote.

One man's landmark is another man's laughing-stock, and nowadays as well as 140 years ago, Mr Rand was pretty much "out there", alone in his



Fig. 2. *Vanity Fair*'s cartoon of the Flower Committee of the Massachusetts Horticultural Society searching for heather at Tewksbury, Mass.

contention that heather is indigenous to North America. The affair created a stir, though, and it even inspired a send-up in that New York avatar of good taste, *Vanity Fair* magazine, in whose 22 February 1862 issue a caricature appeared under the title "Heather and Weather."

A few days ago, as the sun was busily employed in gilding a very pretty landscape, the passers along a quiet lane at Tewksbury, near Boston, were arrested by a novel and curious sight. Several elderly men, some of them stoutish, others scraggyish, but all of solid and respectable appearance, were seen scattered over an area of an acre or so in extent, apparently occupied in the process of grazing, or pasturing themselves upon the scanty herbage, their postures being of the fashion known as 'all-fours,' and their heads close to the ground. It was some time before any person had sufficient presence of mind to address himself to any of the strangers, as, if not grazing, they might have been praying, and it is not Boston manners to disturb decent-looking citizens either from their prayers or their provender.

At last, however, a smart shower of rain came down, upon which the mysterious grubbers arose precipitately to their feet and toddled off to a neighboring farmhouse for shelter. Here it transpired, upon inquiry, that the strangers were certain Wise Men of Boston, forming in the aggregate what is

called the 'Flower Committee' of that city, and that they had been occupied in investigating the subject of a 'native heather,' said to have been discovered in the field just deserted by them.

They had several fine specimens of the plant, and might have been now in fine spirits about it had not the farmer, a Scotchman, informed them that it was not Heather, but good, old-fashioned, rough-and-ragged Scotch thistle, upon which they feed donkeys in his country.

This, combined with the shower, was rather a damper, and the sages made their way back to Boston with all speed, wetter if not wiser men.

Alas, the records of Massachusetts Horticultural Society do not tell us whether poor Mr Rand was laughed out of office, or whether his term at the helm expired, but he was no longer the chairman of the Flower Committee in 1863.



Fig. 3. Mr John Strachan and Wife



Fig. 4. Mrs Margaret Strachan Murray

And what of young Jack Dawson? The story of his later years is lost in the mists of time, too, but if the Flower Committee had dug just a bit deeper they might have found out what he was doing in the heather field in the first place. It was the farmer's daughter, Mrs Margaret Murray, née Strachan, (or "Stratton, as we girls changed it," to quote the old lady's quaint remark) who told a writer at the turn of the present century what really happened.

Margaret saw the heather and was attracted by its pretty little purple bells. She brought a sprig to her father, a native of Auchinblae, Kincardshire, who said, "Why, that looks like Scotch Heather!" He verified the find with another Scotsman, gardener Alexander Skene of Andover, and everybody went down to the field for a good look and a few bouquets.

"I gave a few sprigs to a girl friend of mine," recalled old Mrs Murray, "who Jack Dawson, then a young fellow, was comin' round to see; and when he noticed the sprigs of Heather on her table he wanted to know where she got them. She told him, and the first thing we knew the public was makin' a big time over it, and the committee came down to see it.

"After that the man who owned the land, who told Father that for twenty years he had been plowing the Heather up to keep it from spreading over the cow pasture, thinking he could make something out of it, forbade us girls to go near the spot. That's how many years since I've seen the Heather. I wonder if it's as pretty as it was then!"

The town of Tewksbury has joined the sprawling suburban tide of Boston now, and the old Livingston farm has grown its final crop – the houses of a modern bedroom town. Chairman Rand's grand theory, published under the title *Calluna vulgaris, A Native of the United States* lies quietly forgotten in the handsome leather-bound volumes of Mass Hort's library on Massachusetts Avenue. And the heather follies of 1861 have faded like a mere blip on the radar screen of American horticulture.

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Recent development of pot-flower production of Cape heaths in Japan

SATOSHI MIWA

64-10 Yasumatsu-cho, HAMAMATSU 435, Japan.

In the last decade Cape heaths have become a significant part of the pot-flower market in Japan. Until the late 1970s, *Erica canaliculata* was the only Cape heath grown for this market. *E. gracilis*, commonly grown for the same market in Europe, doesn't respond well in our climate and is only rarely available in Japan.

Around 1975 a nurseryman in Tokyo released a heather of unknown origin under the name *Erica x hyemalis* 'Christmas Parade'. He had obtained it a few years earlier at a street market in Paris. This heather dominated the pot-flower market within a few years, but after a while another cultivar of *E. x hyemalis* appeared, its origins also unknown, and this soon got an advantage in the market.

These two forms are closely related having rose-pink tubular flowers but their flower colour and flowering periods are slightly different. 'Christmas Parade' is thought to be more ornamental but the other cultivar is more robust and so is easier to grow. A third heather, that is very similar to these two cultivars, has long been known in New Zealand under the name of *E. hybrida*, and this has also been introduced to the Japanese pot-flower market in a small way. At present, there are at least three different cultivars of *E. x hyemalis* all being marketed under the name, 'Christmas Parade'.

In early 1980s Masato Shiota, a pot-flower grower in Hamamatsu, introduced *E. sparsa* (= *E. floribunda*) as a pot-flower plant for the Japanese market. This species which is very floriferous has tiny pink bells for three months or more. Although its flower colour is very similar to *E. canaliculata* it is much more charming

Within a few years Shiota successively introduced other Cape heaths, to the Japanese market, such as *E. formosa* with its small urn-shaped pure white flowers and *E. blandfordia* which bears a profusion of yellow bells. Their novel flower colour and high ornamental value were very welcome additions.



Fig. 1. *Erica x hyemalis* 'Christmas Parade'



Fig. 2. *Erica fastigiata*



Fig. 3. *Erica bauera*



Fig. 4. *Erica sparsa*

As they are relatively easy to propagate and grow, these three Cape species are now produced by many other growers, and have become extremely popular. In recent years these heaths have been mostly produced in small pots, but very small quantities of well-grown, high quality plants are also available. Following the favourable reception of Shiota's new introductions by the market, Cape heaths became objects of attention for many growers. Other Cape species such as *E. baccans*, *E. cerinthoides* and *E. colorans* were brought from New Zealand and growers were soon producing these for the pot-flower market.

Fig. 5. *Erica formosa*Fig. 6. *Erica patersonia*

Many of those species of Cape heath with large showy flowers that have a very high ornamental value are, unfortunately, not easy to propagate on a commercial scale by cuttings, nor is it easy to train these plants into a good shape. Furthermore, they are not easy to grow in our climate, especially in those areas that have hot and humid summers. These technical problems have to be solved before we can produce high quality pot plants.

Shiota has taken the lead in growing *E. baueria* (bridal heath) which has very attractive bunches of white or pink, inflated, tubular flowers but a rather rampant growth habit, while its cuttings do not root well. He has been sending out well-trained pot-plants of this species for about ten years but no other grower follows him at present. The most notable progress made in recent years has been in the production of *E. patersonia* from cuttings. The flowers of this species are very eye-catching, a vivid golden yellow, but rooting such cuttings is very difficult. Last year, Shiota succeeded in obtaining a high percentage "take" with these cuttings and expects to send plants out to the market in the coming season.

Other Cape heath species which have been introduced by Shiota during the last decade are *E. hirtiflora*, *E. ventricosa*, *E. fastigiata* and *E. regia* var. *variegata*. Further species are now under trial and it is expected that these will be appraised by the market within a few years.

For most Cape heaths, cuttings are taken in mid-autumn through to early winter. Rooted cuttings are "pinched" at least once, but often three or more times according to their growth habit in order to produce well-shaped plants. The production period is 10 to 15 months from cuttings, and the final



Fig. 7. Notable progress has been made in recent years in the production of *E. patersonia* from cuttings.

pot sizes are mostly from 9cm to 12cm. Though most Cape heaths can overwinter outdoors in southern coastal parts of mainland Japan, some protection from dry, cold wind and occasional severe frost is needed to ensure pot-plants of high quality. Heating is not needed. In summer months we have an almost tropical climate. Continuous rain with high temperatures often causes wilting or die-back of shoots. Those species which flower in autumn and early winter need drier soil conditions at this season to ensure floriferous plants. Thus the plants are grown under cover all the year round. In summer it is essential to keep the environment as cool as possible, but plenty of sunshine is also necessary to produce robust plants.

Cape heaths are expected to become even more popular as pot-flowers in the Japanese market. At present, the breeding of new hybrids is not practised but that is something some Japanese horticulturists may soon try.

Solving the mystery of our Honorary Members

RON CLEEVELY

Honorary Secretary, The Heather Society.

Reading through the *Rules of the Heather Society*, one soon comes across Rule 3 that states:

The Society shall consist of Members and Honorary members.

After indicating that these need to be persons, societies or institutions interested in horticulture or botany, it clarifies the second category as

Persons who have rendered distinguished service to horticulture or the Society, may be elected by Council as Honorary members.

I have a note (but have mislaid the source) that this status was conferred on members of a scientific panel '*who assisted in answering abstruse questions submitted by members*', but I have no idea as to their identities. The main result of being elected an Honorary Member is that, in recognition of their service, the benefits of membership, including the Society's publications are received without paying any further subscriptions. I have to confess here that I have enjoyed this status for some 17 years as a result of my work in producing indexes to the *Yearbook* (and *Bulletin*, which was never printed) that few members required!

Surprisingly, few present members of Council are aware of the names of this elite group and in order to answer the mystery, I undertook the search for information. However, the Administrator, Anne Small, knew their identity since she deals with subscriptions, addresses and the distribution records.

The first clue is a list of Honorary Members that occurs at the end of an "Alphabetical Register of Members of The Heather Society (joining before September 1977)" found at the opposite end of a folio containing "Elections, Reports, Agendas & Minutes from October 1962 until 17th September 1977" compiled by the Society's first Secretary Mrs Constance MacLeod. That closing date is significant because it marked the end of an era when the responsibility for running the Society was taken over by an agency when she resigned and handed over these records.

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|--------------------------|--|------------------|
| J. K. HULME: | Heathers at University of Liverpool Botanic Garden, Ness | 7 September 1968 |
| J. D. BOND | Heathers at Savill Gardens, Windsor Great Park | 7 January 1971 |
| E. G. H. OLIVER | Cape heaths, University of Stellenbosch | 3 December 1972 |
| T. UNDERHILL | Technical help with S.W. Group | c. 1973 |
| † V. R. A. RUSS | Work at Harlow Carr | 11 March 1975 |
| Geoffrey SMITH | Superintendent, Harlow Carr | 11 March 1975 |
| † O. J. CLAYTON | Heathers at RHS Gardens, Wisley | 11 March 1975 |
| Ir K. E. HUIZINGA | Translation of <i>Ericultura</i> | 11 March 1975 |
| Mrs J. M. DUNN | Airthrey Garden Group, Bridge of Allen, Scotland | 11 March 1975 |
| † K. H. FARRAH | Administration 1977–1984 | 11 August 1981 |
| Mrs B. FARRAH | Administrator 1984–1986 | 11 August 1981 |
| J. D. MAIN | Help with Harlow Carr trials | c.1982 |
| R. J. CLEEVELY | Indexes | 24 November 1982 |
| C. D. BRICKELL | President, The Heather Society, 1977–1989 | 29 November 1989 |

† = deceased

Honorary members of The Heather Society

Searching through the minutes, the earliest reference to honorary membership occurs in a financial statement given by the Treasurer (E. R. Turner) on 15 March 1972 announcing that this would be offered to Mr Russ for his work with the Harlow Carr Heather Project. Yet, this may not have been effected until three years later, for the minutes of 11 March 1975 record that V. Russ, Geoffrey Smith, O. J. Clayton, Mrs J. N. Dunn and De Heer Ir Huizinga had been elected as honorary members. Despite the necessity for the approval of Council, only two other instances are recorded in the minutes; my own election on 24 November 1982, and that of Chris Brickell when he was elected on his retirement from the office of President on 29 November 1989.

Most of those in the complete list are well known and have been members of the Heather Society for many years; in fact Terry Underhill was one of the Founders.

As an indication of past justification for conferring this status, perhaps I can quote Pat Turpin, who described John Clayton, the PRO at Wisley, “as one of the best friends ... this Society ever had”; while Victor Russ, a retired banker who lived close to Harlow Carr, was involved in the recording of the heather trials that were carried out there and also served as the Society’s Auditor from 1978 to 1984.

With the hope that several short articles from various Honorary Members might convey something of the history of the Society, or the changes in heather horticulture during the period, it was decided to approach several of those listed for a short contribution. These articles, mentioning how or why they became interested in heathers during their careers, or alternatively particular incidents of heather cultivation, could be published in a special edition of the *Yearbook* to mark the year 2000. The following contributions by Geoffrey Smith and Ted Oliver contain references to their careers, reveal some aspects of their growing interest in heathers and its practical application at Harlow Carr by the first author, and in his research and publications by the second.

GEOFFREY SMITH: Reminiscences of heathers

‘Having enjoyed so many heathery adventures and experiences it was hard deciding which one to describe. Perhaps the beauty of Carlsmoor in Autumn where Calluna grows more luxuriantly by far than anywhere in Scotland? Or should it be Africa and the amazing spectacle of a vivid blue Mandarin bird sipping nectar from the flowers of Erica fastigiata, which my African companion called the “four sisters”? Instead I chose my learning days.’ [from a letter to the Assistant Editor]

To someone born on the moor edge, heathers refer to just one genus of plants and that is the mono-typic *Calluna vulgaris*. Not until I developed a keener interest in botany did the word become a collective name for the 600-plus species of *Erica*, the Irish and Azorian *Daboecia* and the native *Calluna* familiar to me since childhood.

The next stage in the educational process came early in my career, when at the age of 26, I was given the task of making a garden on a windswept hillside in Cardale.

With nothing between me and the Pennine Hills, apart from an overgrown thorn hedge, thoughts of a “Heath Garden” figured prominently

in my plans. Almost as the first sod was turned, people had access to fields that were a garden in name only and heathers provided the “quick fix” of being immediately interesting. Fourteen years later that first “Heath Garden” was dismantled and completely rebuilt using boulders weighing tons rather than mere hundred-weights, this time to a design soundly based on the practical experience I had acquired over the intervening years.

There was, at that time, serving on the Committee of the Northern Horticultural Society several nurserymen who supplied me with a wide range of plants and, more importantly, very sound practical instruction in the business of growing heathers of all shapes and sizes. What astonished me was the number of varieties *Calluna vulgaris*, the ling of my childhood, had given rise to. Mr Brewerton of the Dingle Hollow Nursery sent me a list and invited me to select anything I thought suitable for planting in the recently completed beds from what was on offer. Almost immediately, Mr Milne-Redhead of Holden Clough Nurseries did the same. In conjunction with this collection of *Calluna*, *Erica* and *Daboecia* hybrids, I included conifers, forms of *Acer palmatum*, *Embothrium* ‘Norquingo Valley’ and numerous bulbs.

So many of the varieties of heaths I planted all those years ago are still my first choice when planting a new garden. Apart from *Erica cinerea* and its varieties, all those tried flourished in the clay soil of the Cardale area. *Calluna vulgaris* ‘H. E. Beale’ with soft pink, double flowers on long sprays looked particularly attractive when intermingled with the dark purple blooms of *Hebe* ‘Autumn Glory’. ‘Peter Sparkes’ was another double form but with a deeper shade of pink. ‘Robert Chapman’, a fine foliated plant, turns from gold to flame and finally to deep red at the approach of winter. ‘Golden Feather’, another golden foliated sort, deepened to orange in November. Unlike the lavender pink ‘Robert Chapman’, ‘Golden Feather’ produced no flower spikes.

Erica vagans, the Cornish Heath, was well represented with ‘Mrs D. F. Maxwell’ in deep rose-cerise, and white ‘Lyonesse’ my own choice from the dozen or more planted.

Erica carnea proved to be the most popular with those early visitors to the garden. I still remember ‘December Red’ – a bright rose pink – a sham of a name this, for it never flowers until February. ‘Prince of Wales’, ‘Springwood Pink’ and ‘Springwood White’, and ‘Winter Beauty’ held pride of place for years. Then along came ‘Vivellii’ and ‘Myretoun Ruby’ to steal top place in the trials.

There were tree heaths planted more in hope than anticipation which to my surprise flourished: *Erica arborea* ‘Alpina’ more compactly upright



Fig. 1. Geoffrey Smith (left) with a BBC TV crew in Connemara (E. C. Nelson).

than the type, both of them spring-bloomers; *E. terminalis*, the Corsican Heath, being a summer flowerer had to compete with others of a brighter hue and responded by growing a majestic four feet high.

The Heather Garden struck a most optimistic note for the future development of the Harlow Carr Gardens. On that open, windswept hillside those great patches of year-round colour encouraged me to even greater effort and more adventurous planting.

The following extracts from Geoffrey Smith's *The joy of wildlife gardening – an RSPB guide* (1989) are printed here with his permission

Those lazy, hazy days

Groups of common ling (*Calluna vulgaris*) are colourful, labour-saving garden plants and useful dwarf shrubs for foraging insects. Slow worms and grass snakes soon discover a heather bank broken by drystone retaining walls give most acceptable accommodation. The bare patches between the groups of heathers or the sun-warmed stones are ideal spots for a snake to take a siesta, with the un-mortared recess in the wall as a safe retreat.

My first encounter with a grass snake was on just such a heather bank sloping down to a stream. I was supposed to be hard at work top-dressing bare soil with leaf mould, when my attention was drawn to what looked like an outsized eel swimming across the tadpole-filled pond. Only when the supposed eel wriggled out onto the bank, coiled like a carelessly dropped piece of rope on the rough hewn stone path did I realise it was, in fact, a grass snake.

A dip in the pool, combined with a light lunch of tadpoles, followed by a luxurious sun bath, proved to me (a son of toil!) that the snake had fared better than Adam in that dispute in Eden.

Cover story

Heathers almost fill the twin criteria of ornaments and weed suppressors. They are also very good for wildlife. Unfortunately, apart from a select few, they are extremely fastidious in their soil requirements, which must be lime-free.

... Given an acid soil with all the vast legions of *Calluna* and *Erica* at our command, then a heather garden will provide year-round flowers, a "Joseph's coat" of many coloured foliage, and the sort of cover that insects, spiders, some birds, reptiles, and sundry mammals thoroughly approve of.

E. G. H. ('Ted') OLIVER: An obsession with *Erica*

I was born in Rondebosch, Cape Town, on 14 October 1938 in the shadow of Table Mountain. My parents were Geordies who had come out to Cape Town on holiday and never returned to Tyneside. All my education was received in Rondebosch. At primary school, Sophia, the present Queen of Spain, was in our class because her parents were in exile in Cape Town during the War. Secondary education was in a 100-year old Anglican Church School for boys with a very English tradition – three-quarters of staff had Oxford or Cambridge degrees. One of its earlier headmasters came from Rugby College and had introduced rugby to the school and country.

During my childhood I had a fascination for aquatic life and kept tadpoles and other aquatic "creepy-crawlies" in tanks in my bedroom to the horror of my mother. This led to my keeping tropical fish, an interest I have continued to this day, with some still kept in a tank I received as a birthday

present in 1952! So needless to say, when I went to the University of Cape Town, I registered for zoology, but the professor made me take botany as an extra subject. Although I had an interest in the garden at home because my parents were passionate gardeners, I was not that keen on plants (unless they grew underwater!).

Halfway through the first year I was introduced to the Cape Flora and *fynbos* vegetation. This was familiar to me from holidays spent along the coast at Kleinmondstrand where the family went for walks into the mountains and I had seen, but not really registered, the wealth of species. Suddenly the penny dropped and the Cape Flora became my obsession. *Ericas* attracted me because they were small and delicate with a seemingly infinite variety of shapes and colours. With the Bolus Herbarium close at hand, I was introduced to their wonderful collections and books. It was there that I met botanists like Dr Louisa Bolus, Neville Pillans and the remarkable collector, Elsie Esterhuysen (still alive) who has a phenomenal knowledge of *ericas* in the wild. Thus in late 1958 began my love affair with *Erica*.

On a zoology project at my favourite temporary pools in the Rondebosch Camp Ground, I met an old man who was photographing the spring flowers. He was delighted to hear of my interest in plants and invited me home to see his slides. Thus started a fruitful friendship with Syd Chater, who provided the transport whilst I gave the advice and used my young legs and eyes! We went out camping together most weekends during which I was introduced to almost the whole Cape Floral Kingdom. During my honours year in 1962, I had to curtail these outings but persuaded my father (the same age as Syd) to go along and the two of them enjoyed reminiscing about their escapades in the First World War.

One very fortunate encounter occurred when I attended the national science congress held in 1962 at the university. There I met Dr L. E. Codd, Assistant Chief of the Botanical Research Institute in Pretoria. He offered me a job and said I could do a full-time Masters degree to start with. So I worked in the Bolus Herbarium on the minor ericaceous genus *Acrostemon* under Professor Ted Schelpe. This was my first encounter with the generic problems which were to plague me for the next 35 years!

After completing the M.Sc. in mid-1964, I went to the Government Herbarium in Stellenbosch (some 50km from Cape Town) which had been the university's herbarium since 1903, but as they had no staff it had just been handed over to the institute. I was the first taxonomist to work there and had two ecologists from the Botanical Survey Section with me. I soon realised the problems with curating a large, out-of-date herbarium single-handed and obtained an assistant in 1965.

During these early years I had come into contact with a retired Royal Engineer Colonel Hugh Baker through a newspaper report. He had been attacked while sunbathing on the beach and had an eye poked out. The newspaper report ended by saying he was collecting *Erica* for the British Museum to replenish their collections which had been damaged during the War. My mother realised she knew his wife through her church and after meeting him, we started making trips together. That began the partnership for the 'first' *Erica* book (Baker & Oliver, 1967). Baker had been sending fresh specimens to Johannesburg at the request of the artist Irma Kerr (von Below) who produced superb paintings of them. But what about doing a book? This is where I came in, setting out a plan covering all the known sections and well-known species. We had to get more species painted to fill in the gaps, but Irma had got divorced and moved away to the Garden Route where she was quite unreachable. I then persuaded the local artist, Fay Anderson, to deal with the rest of the species (nearly half in fact), while my old friend Syd Chater took on raising the necessary funds for the publication.

Then came the "bombshell" for that book – the institute offered me the liaison post at Kew which of course I accepted. This put pressure on finishing the book in a very short time, which was only achieved the week before I flew off to London ! What an experience for a young "colonial" botanist to be at the Mecca of his subject – a real thrill and joy even in those prim and very proper days. It gave me access to all the old books and collections at both Kew and the British Museum (Natural History).

Inevitably, at this time, I came into contact with the newly formed Heather Society in the person of Constance MacLeod, David McClintock and Dr Ronald Gray. The friendship with Constance continued for a long time and she visited me at Stellenbosch while I called at her wonderful old garden at Yew Trees several times. Of course, the link with David McClintock is still there and is kept alive with much correspondence.

After two and a half years, I returned to Stellenbosch and again managed to get my teeth into the "minors" – the little known heather genera. In 1974, I married one of our assistant botanists, Inge Nitzsche, who had also done botany and zoology at Cape Town, but had followed it up with a Fine Art degree – a rare and very useful combination.

In 1976 I was transferred to Pretoria as Head of Herbarium Services and Curator of the National Herbarium (by far the largest in Africa). I stayed there doing administrative work for seven years without a chance of any research. Fed up with the situation, I got myself demoted back to Stellenbosch and the world of *Erica* – it was certainly a much nicer place for my family of

three children to grow up in. Then in 1988 I was blessed by a grant from the institute that enabled me to employ Inge as a research assistant to help with all the technical work – the numerous dissections, drawings and recording of all the details of variations in the plants. This of course helped tremendously with the research and since then we have been able to produce a steady flow of papers. Inge's work also helped with the finalisation of the analyses of the minor ericaceous genera, which were, at long last, submitted to the University of Cape Town for my Ph.D. degree. The external examiners were all Ericaceae experts from the U.S.A. – Peter Stevens, Walter Judd and Kathy Kron.

This work had started out under the old traditional methods of taxonomic research, but later I had to incorporate the new ideas and methodology of cladistic systematics using computer analyses. The final result is the total rationalisation of all the 23 small genera included in the old sub-family Ericoideae into a single "mega-genus" *Erica* with 860 species, 740 occurring in the Cape Flora! In the words of one of the examiners – "the sheer size of the project would have simply overwhelmed most of us".

Contact with The Heather Society was maintained through my participation in the Heather Symposium at the Linnean Society in 1988 where I met David Small and Charles Nelson. Several stints at the Chelsea Flower Show introduced me to other enthusiasts including Dee Daneri from the U.S.A. This was increased when I attended the Society's Annual Conference held at Dublin in 1995 with Deon Kotze from Kirstenbosch. There we met many old friends and made new ones, whose names I had only known from the *Yearbooks*, or *Newsletters* that Constance MacLeod had sent me over the years.

In 1988, our institute was amalgamated with the National Botanical Gardens to form the new National Botanical Institute with its head office at Kirstenbosch. Five years later, in 1993 we moved our herbarium to the new research building there and, now combined with the Compton Herbarium, it forms the second largest herbarium in Africa. Our collections and research are concentrated on the winter rainfall flora of southern Africa.

Another ericaceous milestone that developed during the 1980s, was the book on ericas which eventually appeared in 1992. This resulted from my introduction of Dolf Schumann to Gerhard Kirsten, both very determined *Erica*-amateurs who would stop at nothing until their goals had been reached, and I have had the privilege of working with, and encouraging them, over the years.



Fig. 2. Inge Oliver at her desk in the Herbarium at Kirstenbosch.

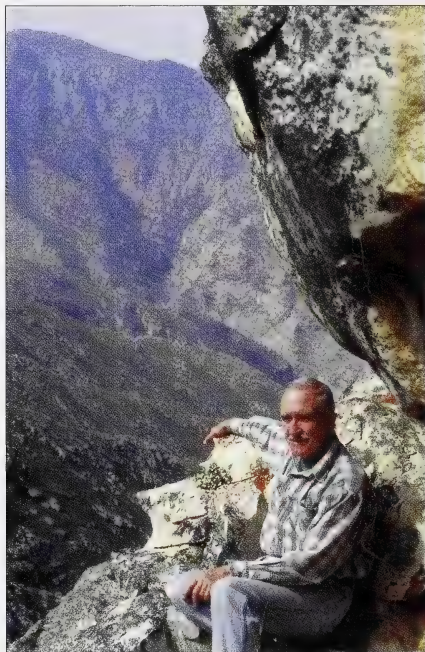


Fig. 3. Ted Oliver in the Pilaarkop mountains.

Having begun work on the Ericaceae some 40 years ago as a student, I now find that I am getting to know the group properly, the more so recently because of the rapidly increased knowledge that Inge has also acquired. I am no longer a single person struggling in "a sea of ericas". There are now two of us to discuss the problems of species de-limitation, species evolution and the phylogeny, ecology or phytogeography of this fascinating genus. There are quite a number of new species to be described and surprisingly, other un-described species are still being brought in. The biggest problem ahead is that of sub-generic classification. The new techniques of DNA analysis will help to throw some light on this problem, which is now being tackled by a group of international experts with material that I am supplying for them. Hopefully I will still be around to see the final analyses of this daunting task.

Erica kirstenii, a new rock-loving species from South Africa.

E. G. H. OLIVER & I. M. OLIVER

Compton Herbarium, National Botanical Institute, Private Bag X7, CLAREMONT 7735, South Africa

There are a number of species of *Erica* in the Cape region which can be allied to each other on the basis of their woody, often gnarled growth, medium-sized urceolate flowers with showy, coloured bract, bracteoles and calyx edged with short to long plumose hairs which may also be gland-tipped, and their included anthers which often have large showy appendages. All grow at high altitude on the inland mountains of the Western Cape. Some of the species are *E. goatcheriana* and its various described varieties, *E. monsoniana*, *E. modesta*, *E. oresigena*, *E. schumannii*, *E. lanipes*, *E. dianthifolia*, this despite their placing in different sections within the genus in *Flora Capensis* (1906). Within this set of species there are clear indications that some need further investigation to assess their infraspecific variation and the possible erection of new species. There are also several undescribed species within the group, one of which is described here.

E. kirstenii is restricted to the Klein Swartberg range of mountains which occurs just north of the town of Ladismith. The species was collected in the first botanical exploration of these high mountains by a team of amateur botanists in December 1928. Subsequently it has been collected a number of times and identified as "near" *E. oresigena* var. *mollipila*.

The habitat is rocky places, either cliffs faces, rock ledges or in cracks of large rock outcrops. No plants have been seen by us in open ground. Esterhuysen noted that plants on Toverkop occurred in rock crevices and were common on the northern side just below the summit. In these situations the shrublets are small and gnarled, sometimes slightly spreading along the crevices or over the rocks, but may become quite woody and erect in favourable places. Most localities occur at high altitude (6,500–7,000 ft; c. 2,000m) with the type locality and others on the southern ridge of Seweweekspoortberg probably being low outliers at 5,000 ft (1,700 m). The type collection was made on a joint trip with Thys de Villiers of Caledon.

We have great pleasure in naming this attractive and interesting species after Gerhard Kirsten, amateur ericologist without equal, former sports journalist and lover of nature, who has made a special effort to study



Fig. 1. *Erica kirstenii*.
Close-up of a flowering branch.

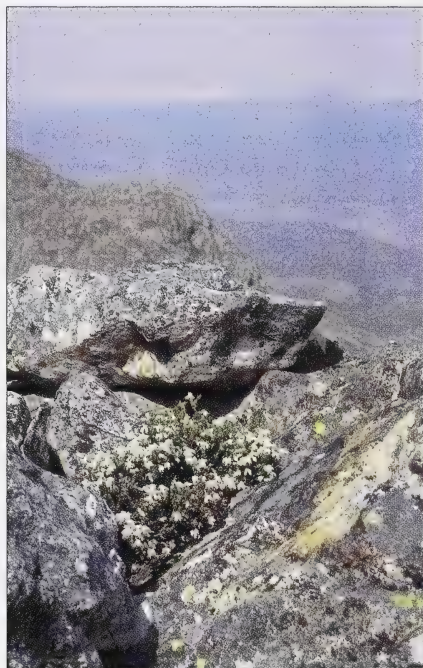


Fig. 2. Plant of *Erica kirstenii*
in natural habitat.

and collect as many species of *Erica* in the Cape Floral Kingdom as he could find (see p. 4, this issue). Over the past 30 years he has built up a remarkable knowledge of the genus as it occurs in nature which is reflected in the publication of the superb book *Ericas of South Africa* together with Dolf Schumann.

The name of this species is very appropriate for several reasons. Gerhard's family background lies in the Ladismith District where he was born in 1931, spending 17 years there before going on to Stellenbosch University and then to Cape Town where he worked for *Die Burger*, the local Afrikaans language newspaper. His mother was born on the farm Weltevrede at the southern base of Seweweekspoortberg with the nearby Weltevrede River draining the slopes where the type collection was made. Gerhard himself collected the species as a *species incertae* at this locality in 1972.

Another reason is the close botanical relationship between *E. kirstenii* and *E. schumannii* (see above and *Yearbook* 1998: 32–38) and the co-authorship

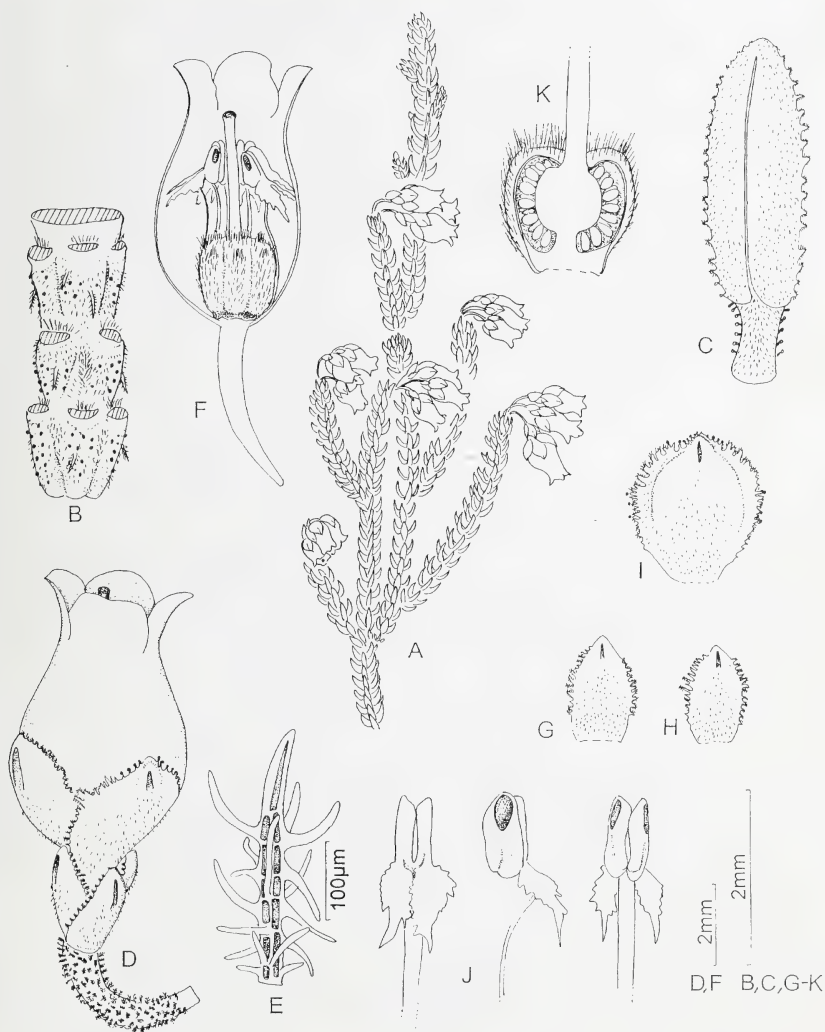


Fig. 3. *Erica kirstenii*. A, flowering branch, natural size; B, stem; C, leaf; D, flower; E, plumose hair from pedicel; F, flower, opened from the side; G, bract; H, bracteole; I, sepal; J, stamen, back, side and front views; K, ovary, cut in half. All drawn from the type collection *Oliver* 11330. © Inge Oliver.

of their wonderful book on ericas. Previously they brought in a very remarkable small-flowered new species which we named *E. amicum* (= of the friends).

E. kirstenii is allied to the recently described *E. schumannii* (compare Fig. 3 here with the figure in *Yearbook* 1998: 32). The latter species has a long point to the leaf, bright pink flowers, longer, narrow, more acute anthers with white appendages, the ovary not emarginate and the placenta a naked flap-like structure. *E. schumannii* also grows in rocky places but forms almost flat mat-like plants spreading over the rocks.

The new species is also related to the taxon currently known as *E. oresigena* var. *mollipila* which occurs in a very disjunct distribution range in the Cederberg and then in the Klein Swartberg. It has noticeably narrower and longer sepals and the plumose hairs on the plant are longer and crisped giving the plant a woolly appearance. The corolla lobes are also much longer and more spreading. Both species grow on Seweweekspoortberg, but the latter is found in coarse, sandy soil among short, restiad-dominated vegetation and not in rock crevices.

One special feature of this species is the faint reddish tinge to the white flowers. This is caused by the large, bright red appendages to the anthers seen through the translucent yet rather hard corolla. This feature is not often seen in the genus.

Erica kirstenii E. G. H. Oliv., sp. nov.

Frutex lignosus parvus compactus prostratus vel erectus usque ad 300 mm, folia 3nata dentibus plumosis, bractea bracteolisque calyxque eburnea breve plumosociliata, omnes ovata ad late ovata, corolla urceolata alba translucida glabra, antherae inclusae appendicibus magnis rubris, ovarium emarginatum, pubescente, stylum inclusum, stigma subsimplex, testa reticulata parietibus anticlinalibus undulatis crassis. Fig. 3.

TYPE: SOUTH AFRICA, Western Cape, 3321AD, Ladismith District, Seweweekspoortberg, ridge running south from the peak, 1700 m, 6 September 1999, E. G. H. Oliver & I. M. Oliver 11330 (NBG, holotype; BM, BOL, K, MO, NY, P, PRE).

Shrublet compact woody 10–25cm tall or very gnarled and much smaller in very exposed habitats. **Branches** numerous main branches 10–20mm long, rarely 40–80mm, mostly terminating in an inflorescence, occasionally continuing vegetative growth, secondary branches only from occasional nodes, 10–15(–30)mm long, terminating in an inflorescence; internodes very short \pm 1mm, with slight infrafoliar ridges, all covered with short retrorse simple hairs and a few sessile to shortly stalked red or orange-brown glands, also very occasionally longer plumose hairs admixed.

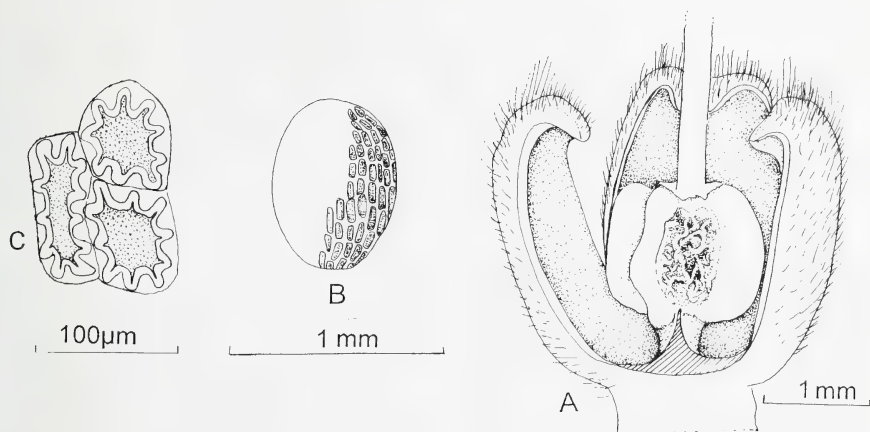


Fig. 4. *Erica kirstenii*. Fruit details; A, capsule with one valve removed; B, seed; C, testa cells. Drawn from Oliver 11330.

Leaves 3-nate, erect imbricate, 3.0–4.0 × 1 mm, narrowly elliptic, rounded abaxially flattened adaxially, margins acute with short plumose teeth, in younger teeth sometimes ending in small, pale orange to dark red glands, finely puberulous, dull green to slightly glaucous; petiole appressed, 1 mm long, white, shortly ciliate with small dark stalked glands. **Inflorescence:** flowers 3-nate in 1 whorl at ends of main or secondary branches; pedicel ± 3 mm long, red, covered with white plumose hairs ± 300 μm long; bract partially recalcrescent in position two-thirds up pedicel, 2.5 × 1.5 mm, ovate, white tinged cream, finely puberulous mainly towards the base, ciliate with plumose hairs (sometimes gland-tipped) in apical $\frac{3}{4}$, very shortly narrowly sulcate, the apex greenish; bracteoles 2 placed just above the bract, 2.0 × 1.2 mm, otherwise like the bract. **Calyx** 4-partite; lobes appressed to corolla, 3.5 × 3.0 mm, broadly ovate, white tinged cream towards apex, finely puberulous in lower half, margins shortly and irregularly toothed, teeth plumose with or without a gland-tip, sulcus ± 0.6 mm long narrow. **Corolla** 4-lobed, 7–8 × 4 mm, urceolate, glabrous, hard textured, white, semi translucent with red anther appendages giving red tinge; lobes 2.0 × 1.5 mm, rounded to subacute, slightly recurved, margin entire but slightly erose at base. **Stamens** 8, included, free; filaments 3 mm long, linear oblong, slightly flexed below anther otherwise straight, glabrous; anthers bipartite oblong, appendiculate; thecae erect appressed, 1.0 × 0.5 mm, oblong, obtuse, brown, appendages ± 1.0 × 0.5 mm, broad, subpendulous, variously toothed, red to red-brown; pore 0.4 mm long; pollen in tetrads. **Ovary** 4-locular, 1.5 × 1.5 mm, ellipsoid, emarginate, green, densely hairy, with red nectaries around the base; ovules 60 per locule, spreading from a complete placenta; style 3 mm long straight, greenish; stigma included, subsimple truncate, purple. **Fruit** a dehiscent capsule, valves hard textured, splitting nearly to

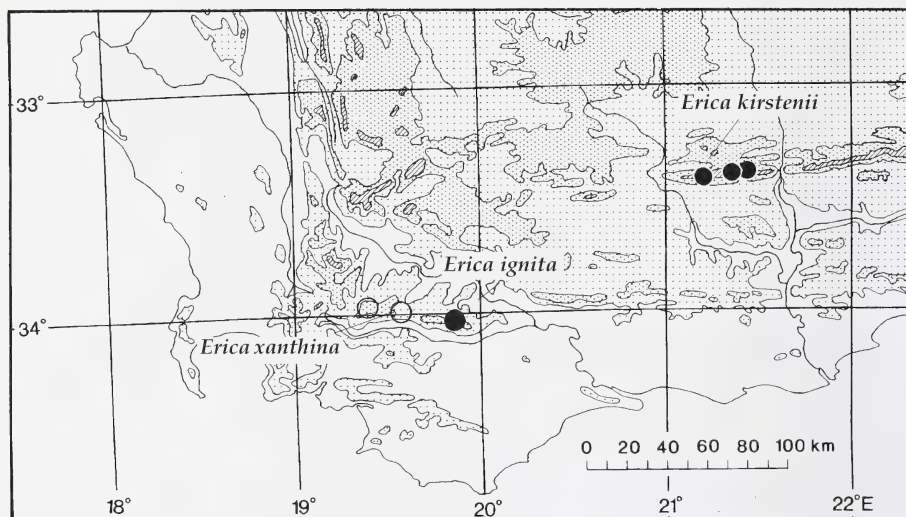


Fig. 5. The known distribution of *Erica kirstenii*, *Erica ignita* and *Erica xanthina* in the Western Cape, South Africa.

the base, opening to only 30°, septa only on the columella; seeds $\pm 0.8 \times 0.6$ mm, ellipsoid, dark brown, reticulate, testa with thick undulated anticlinal walls, minutely pitted. Figures 3 and 4.

PARATYPES: WESTERN CAPE – 3321: (-AC), Ladismith, Toverkop, 7000 ft, 5 September 1947, *Esterhuysen* 13935 (**BOL**); *ibid.*, 6500 ft, 16 December 1956, *Esterhuysen* 26763 (**BOL**); *ibid.*, 2 September 1973, *Esterhuysen* 33227 (**BOL, NBG, PRE**); (-AD), Ladismith, Seven Weeks Poort (Seweweekspoort) Mtn, 5000 ft, 12 October 1955, *Esterhuysen* 24776 (**BOL, K**); *ibid.*, 5000 ft, 23 September 1972, *Kirsten* 321 (**NBG**); *ibid.*, 5200 ft, 25 September 1998, *Oliver* 11150 (**NBG**); *ibid.*, 6000-7000 ft, December 1928, *Primos* 21 (**BOL, PRE**); *ibid.*, without date, *Stokoe* 7878 (**BOL**); Swartberg just east of Seweweekspoort, above Rocklands, 6300 ft, 14 October 1980, *W. Bond* 1784 (**NBG**); *ibid.*, 1950 m, 7 October 1993, *Oliver* 10369 (**NBG**). Locality not located: (-AC/AD); Klein Swartberg, N. side above Kouveld, 6500 ft, 22 May 1957, *Wurts* 1493 (**NBG**).

Erica ignita, a showy new species from South Africa

E. G. H. OLIVER & I. M. OLIVER

Compton Herbarium, National Botanical Institute, Private Bag X7, CLAREMONT 7735, South Africa.



Fig. 1. Plants of *Erica ignita* in their natural habitat.

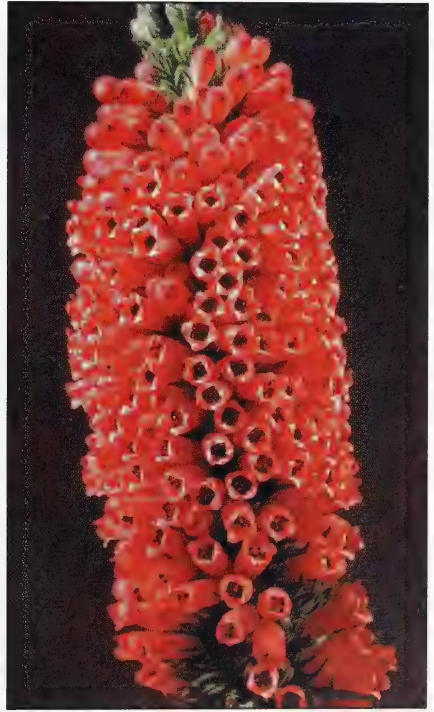


Fig. 2. *Erica ignita*. Close-up of a dense synflorescence.

In the previous five issues of the *Yearbook* we have described five new species of *Erica* from the Cape, some of which were recent discoveries, *E. magnisylvae* and *E. hanekomii*, whereas the others had been languishing in the unnamed or incorrectly identified collections in the local herbaria waiting to be 'discovered' and investigated. There are still several dozen new species among the latter category that we need to re-collect in the wild and work on. One of them we have kept for *Yearbook* 2000 because of its striking appearance.

The new species we are describing here was first noted by the botanist Neville Pillans as long ago as 1926 when he saw some specimens exhibited at the Caledon Wildflower Show, but without any indication of their origin. Then it was turned up by that indefatigable mountaineer and collector Thomas Stokoe in 1940 and again in 1945 when climbing the very long range of mountains near Riviersonderend, but again without any exact details. The exact location of the populations was only recorded when Elsie Esterhuysen of the Bolus Herbarium, University of Cape Town, started climbing this range in the 1960s. Together with Prof. Peter Jackson, she brought back material several times. She had problems with the identification and thought the material should be placed under *E. xanthina* Guthrie & Bolus which was a poorly understood and, unfortunately, misinterpreted species from further west in this long mountain-range.

We have examined the case of *E. xanthina* which Guthrie and Bolus based on a single collection at Kew made by Dr R. C. Alexander-Prior above Genadendal in the 1840s, a few scraps of which are in the Bolus Herbarium. No subsequent material was attributed to this species. In 1969 Col H. A. Baker described material collected in the Genadendal/Greyton area as *E. parvulisejala*. He made no mention of *E. xanthina* or the collections of material mentioned above, and regarded his species as allied to *E. colorans*. Comparison with the fragments of Guthrie and Bolus's type clearly shows that *E. xanthina* and *E. parvulisejala* are the same species.

We have made two trips to the populations on Pilaarkop and have examined much fresh material for variation. The new species clearly shows several characters that differ from those of *E. xanthina* which we have also studied in the wild. In *E. xanthina* the flowers are finely hairy, i.e. the pedicel, bract, bracteoles, corolla and ovary (all glabrous in the new species), the sepals are very broadly ovate (not ovate-trullate), the ovary is constantly 4-locular (not variably locular from five to seven), and the seeds are very different (see below). Of course the most striking difference is the colour which, however, is not always a good differentiating character in *Erica*, at least not as the sole character on which to base a species – *E. xanthina* being pale pinkish yellow and the new species red flushed with orange.

Other species that are possibly related to *E. ignita* are *E. patersonia*, and *E. galpinii*, both having similar densely flowering synflorescences but with a yellow, glabrous corolla, glabrous 4-locular ovary, and anthers with long appendages. Several tubular-flowered species from the Bredasdorp to Kogelberg area, *E. macowanii*, *E. kogelbergensis* (see Yearbook 1996) and *E. colorans*, have the similar unusual feature of ovaries with more than four

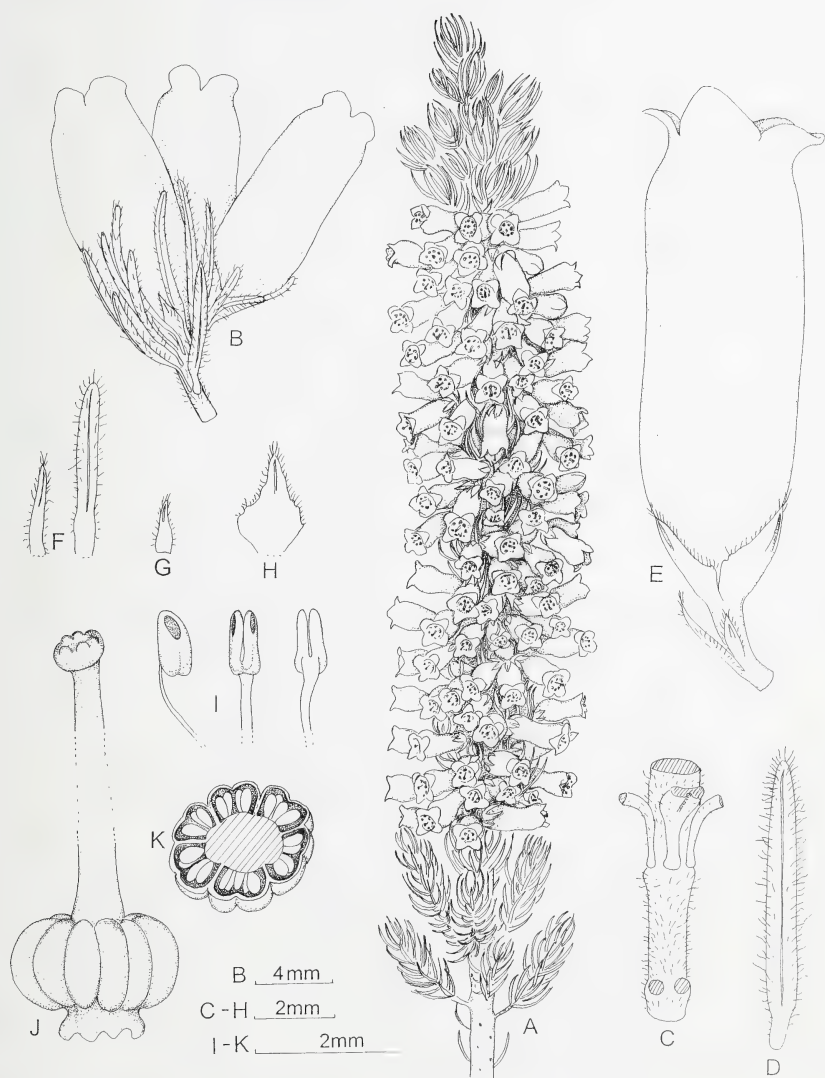


Fig. 3. *Erica ignita*. A, flowering main branch with a single spike-like synflorescence, natural size; B, flowering branchlet with 3-flowered inflorescence; C, stem; D, leaf; E, flower; F, two bracts showing size variation; G, bracteole; H, sepal; I, anther, side front & back views; J, gynoecium; K, ovary, half section. All drawn from the type collection, *Oliver 10944*.

locules, but their flowers are hairy and arranged in a looser spikelike synflorescence. There are other differentiating characters in the calyx, anthers, and fruits.

The name chosen for this new species (*ignitus* = fiery, glowing) refers to the immediate impression one gets when seeing the flowering plants for the first time in the wild – long dense spikes of fiery red flowers (as if ignited), seen to great effect on looking up the very steep slopes with the sun shining from behind the plants. This colour dulls when viewed with light from the front. Adding to the attractiveness of the flowers are the pale orange-brown spreading corolla lobes.

When investigating differentiating characters between *E. xanthina* and the new species we were surprised to find very good differences in the seeds. The seeds at first glance appear to be similar, certainly in their shape and colour, but on microscopic examination are very different. The testa of *E. xanthina* is composed of numerous small cells which are slightly invaginated with low anticlinal walls whereas *E. ignita* has few large cells which are deeply sunken producing very 'high' anticlinal walls. The outlines of the cells are very different with thick and slightly undulate anticlinal walls in the former species, and straight and very thin in the new species. The cells have numerous very fine pits in the inner periclinal and the anticlinal walls in *E. xanthina* whereas the pits in *E. ignita* are larger and coalesce. The seed type in *E. ignita* surprisingly has only been recorded so far in *E. conferta* which grows on the same slopes but also extends into the Langeberg. Seed morphology we believe is a whole new field that has not been studied before in *Erica* and could be of invaluable assistance with species delimitation and possibly with the problems of subgeneric classification in the genus.

Erica ignita appears to be very restricted in its distribution (see Fig. 5, p. 62, this issue), occurring as a single, slightly scattered population only on the cool, moist, very steep southern slopes below the summit of the ridge just west of Pilaarkop. West of this ridge the range of mountains up to Skilpadkop has never been botanised due to its very dissected and steep nature. The northern dry slopes can be climbed reasonably easily but not the southern slopes due to the steep dip in the geological strata. East of Pilaarkop to the Olifantskloof divide we have not located any plants and regard their presence there as unlikely due to the less favourable habitat – more open and drier and consisting mainly of rather grassy shale bands. The closely related *E. xanthina* grows in moist grassy-restioid open places, mostly not on very steep slopes, and occurs at the western end of the Riviersonderend Mountains from above Greyton westwards as far as Olifantsberg. Its populations are surprisingly very much smaller than that of *E. ignita*.

The locality is quite remarkable because growing with *E. ignita* are two other undescribed species, both of which are confined to this steep moist slope. These are in the process of being published – *E. columnaris* and *E. orthiocola*, the former common and in places dominant, the latter rare and restricted to a few rock ledges and cliffs. The large, woody *E. pillarkopensis*, which used to be very common before the extensive fire of 1991, is confined to the Pilaarkop area. Also there is the endemic *Lonchostoma esterhuyseniae* in the Cape family Bruniaceae, of which we found only five woody plants on the cliffs. The habitat would appear to be strongly affected by the position of the ridge in relation to the peak itself when south-east clouds come in from sea and swirl past the peak and up over the ridge and could be used to explain the number of endemic species

Despite two visits to the populations during excellent weather conditions and with the plants in full flower, no pollinators were observed visiting the flowers. With their red colour the obvious conclusion is that sunbirds must be the pollinators, but none was seen in the area.

Erica ignita E. G. H. Oliv., sp. nov.

Species in genere distincta propter synflorescentias densas spicatas usque 20 cm longas floribus breve tubulosis atrorubentibus glabris; sepala ovato-trullata; pedicellum cum bractea bracteolisque glabrum; ovarium latissime ellipsoideum glabrum plerumque 6-loculare; antherae muticae.

TYPE: SOUTH AFRICA, Western Cape, 3419BB, Riviersonderend Mtns, Pilaarkop, moist S-slopes below ridge WNW of peak, c. 4800ft, 28 October 1997, *Oliver 10944* (NBG, holotype; **BM, BOL, K, MO, NY, P, PRE, S**).

Erect bushy single-stemmed **shrub** up to 0.5(–1)m tall. **Branches**: 1–5 erect main branches 10–25(–40)cm long continuing vegetative growth, with few short to long side branches 2–5cm long, sparsely puberulous with spreading hairs. **Leaves** 4-nate, imbricate subspreading incurved, 6–10 × 0.8mm, oblong-linear, apex subobtuse, adaxially flattened and abaxially rounded, margins acute, sparsely hirsute; petiole 10mm long, appressed, glabrous ciliate. **Inflorescence: flowers** (1–)4(–6) terminal on short side branchlets c. 5mm long, these arranged in a dense cylindrical spike-like synflorescence 4–20 × 2–3cm; pedicel 2mm long glabrous; **bract** partially recaulescent more or less basal in position, 2–4 × 0.4–0.5mm linear to lanceolate, leaflike to bracteose, the longest leaf-like oblong hirsute and green, the smallest bracteose oblong-lanceolate white to pale green, glabrous, ciliate; **bracteoles** 2, on lower half of pedicel, c. 1.3 × 0.4mm, bracteose, lanceolate, white, glabrous, ciliate. **Calyx** 4-partite, segments appressed to corolla, c. 2.5 × 1.5mm, ovate-trullate, apex

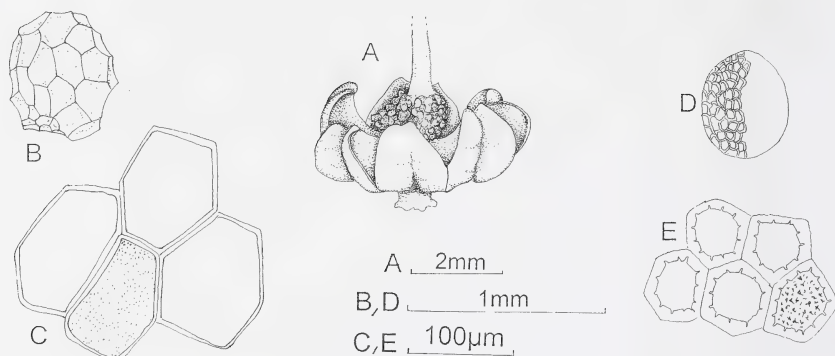


Fig. 4. Fruit details. – *Erica ignita*. A, open capsule; B; seed; C, testa cells (drawn from Oliver 10944). – *Erica xanthina*. D, seed; E, testa cells (drawn from Steyn s.n. in NBG).

acute, margins slightly serrated at base otherwise entire, apically narrowly sulcate for $\frac{1}{3}$ their length, glabrous, ciliate, white. **Corolla** 4-lobed, c. 12×4 mm, tubular oblong slightly contracted towards the mouth, glabrous, with a distinct bloom, dull brick-red flushed with orange, glowing orange-red in transmitted light; lobes 2.0×1.5 mm, subacute to obtuse, entire, spreading to slightly reflexed. **Stamens** 8, included, just reaching the mouth; filaments linear, slightly bent inwards at apex, glabrous white; **anthers** bilobed, oblong in front view, dorsifixed near the base, muticous; thecae ovate, c. 0.9×0.6 mm, roughly textured due to collapsed cells, dark brown; pore third length of theca; **pollen** in tetrads. **Ovary** (5)6(7)-locular, c. 2.0×1.5 mm, very broadly ellipsoid (depressed globose) with a very short stipe, (10)12(14)-lobed, emarginate, with small green nectaries at base of the stipe, glabrous, green; ovules 15–20 per locule spreading, placenta the full length of locule; **style** broad at base tapering to apex, glabrous white; **stigma** included at mouth of corolla, capitate, dark reddish green. **Fruit** a dehiscent capsule, c. 2.5×5.0 mm, septa on valves only, splitting to halfway down, valves subspreading, cucullate, red, thin texture; **seeds** globose-ellipsoid rounded, c. 1.3×1.0 mm, testa light yellow to white, consisting of few large collapsed cells with relatively tall straight anticlinal walls, numerous pits present. Figure 3.

Paratypes: WESTERN CAPE – 3419: (-BB), Riviersonderend Mtns, Pilaarkop, c. 4000ft, 17 November 1965, *Esterhuysen* 31404 (BOL); *ibid.* c. 5000ft, 25 November 1967, *Esterhuysen* 31810 (BOL); *ibid.*, c. 4500ft, 24 October 1971, *Esterhuysen* 32717 (BOL, NBG); *ibid.*, c. 5000ft, 23 October 1971, *Jackson* in NBG 93226 (NBG); *ibid.*, 1500 ± 1540 m, 9 October 1998, *Oliver* 11176 (K, NBG, PRE).

Without precise locality: Riviersonderend Mountains, October 1940, *Stokoe* 7500 (BOL); *ibid.*, 17 October 1945, *Stokoe* in NBG 166044 (NBG).

Without locality: Caledon Wildflower Show, 11 September 1926, *Pillans* in BOL 18547 (BOL).

Heathers and molecular genetics

IAN SMALL

D906, LA GRANDE HOGUE, 78610 Auffargis, France

INTRODUCTION

No-one who has grown heathers for any length of time can fail to be impressed by the immense variety of cultivars: yellow foliage, green foliage, red foliage; pink flowers, white flowers, purple flowers; single flowers, double flowers; prostrate, erect; fast-growing, slow-growing, etc. Moreover, most of this variety can be observed within a single species (notably *Calluna vulgaris*). Of course, such variation is not limited to heathers; roses and rhododendrons are just as variable, as indeed are pigeons, dogs and even people.

For thousands of years, mankind has taken advantage of this natural variability when breeding crop plants, cattle, sheepdogs or racehorses. Breeders can do this because particular characteristics are often inherited; crossing two yellow-foliaged heathers will more often than not give rise to yellow-foliaged seedlings. The study of this variability and its inheritance is called "genetics" and is a venerable science dating back to the time of Charles Darwin (1809–1882) and Gregor Mendel (1822–1884). Much more recently, scientists have made rapid progress in discovering exactly how these characteristics are stored within living organisms, how they are passed on to the next generation, why they vary and most controversially, how to change these characteristics virtually at will. This new science is referred to as "molecular genetics" or "molecular biology" to reflect that it deals with the study of individual molecules. What I hope to do in this short article is to explain, in layman's terms where possible, what molecular genetics can tell us about the plants we grow in our gardens and what the future might hold if the promises that this new science offer can be realised.

CELLS, MOLECULES AND DNA

All living things, heathers and gardeners included, are divided up into microscopic compartments called cells. A typical plant cell is about 50µm in diameter and there are five to ten million cells per gram of leaves. Each one of these cells contains all the necessary information to make a new plant identical to the plant from which the cell was taken. This is easily shown for

plants using *in vitro* multiplication techniques (just a high-tech way of taking very tiny cuttings!), but the birth of Dolly, the cloned sheep, graphically demonstrated that it's true for animals too. This information is stored as a molecule, DNA. DNA is a polymer (like nylon or silk) made of four different chemicals (bases) joined end to end to make a long string. Inside the cell, the DNA is packaged in chromosomes; one can think of them as reels of fishing line (with DNA as the line). Each cell contains several centimetres of DNA, which might not sound much, but represents a thousand times the length of the cell, explaining why it has to be wound up in chromosomes. The DNA molecules in a typical heather plant, joined end to end, would stretch from London to New York at the very least and might even stretch right round the world.

So how is information stored in DNA? As I stated above, DNA is made of four bases (traditionally designated by the letters A, C, G and T) joined end to end. It turns out that it is the order in which the bases are joined together (termed the base sequence) that is important, i.e. the sequence ACGTACGTACGT means something different from TGCATGCATGCA. Whenever a cell divides to make two new cells, the DNA sequence is copied exactly so that the new cells contain the same information as the old one; this explains how the information can be inherited.

How does each cell know what the sequence means? The sequence can be divided up into different zones called genes. As a bit of a simplification, one can say that each gene stores the information for a particular characteristic. Genes consist of a "start" signal and a "stop" signal enclosing a stretch of meaningful sequence. The meaningful sequence is read as a code (the "genetic code") very much as a computer reads a computer program. Each group of three bases represents an amino acid; amino acids are the building blocks of proteins (another biological polymer). For each gene, the cell builds a protein by stringing together the amino acids in the order decreed by the base sequence of the gene. Unlike DNA, which serves simply as a store of information, proteins "do" things. Some proteins go to form physical structures, others act as catalysts, helping to speed up chemical reactions in the cell. Proteins are responsible for just about every visible characteristic of plants and animals (and many of the invisible ones!). Plants are estimated to contain at least 20,000 different genes (contained in more than 100 million DNA bases) and thus are made of at least 20,000 different proteins. The exact number will be known soon, at least for one plant. Scientists in Europe, the USA and Japan are collaborating to determine the complete DNA sequence of thale cress (*Arabidopsis thaliana*), a previously insignificant little

weed that you may well have growing unnoticed in your garden. *Arabidopsis* has become the plant equivalent of the lab rat; scientists use it for testing everything. It's easy to grow, takes up very little space, and grows fast – one complete generation can be finished in two months. Most importantly of all from the point of view of the DNA sequencing effort, *Arabidopsis* has less DNA than almost any other plant; the genes are packed tightly together with few redundant copies. If all goes well, the sequencers will be finished some time next year. If you do find some *Arabidopsis*, take a second look at it. In the field of molecular genetics, *Arabidopsis* is fast attaining megastar status. A big part of that (tiny!) fraction of your taxes that pays scientists to study plants is being spent on this little weed.

VARIATION, MUTATION

I started this article by emphasising the variation between living things. This variation is due to the fact that different cultivars (or species) make different proteins and they make different proteins because their DNA sequence is different. How do these sequence differences arise?

The biggest source of variation is sexual reproduction. Whenever the plant produces pollen and ovules, the genes are shuffled, just as one would with a deck of cards. Each pollen cell or ovule is dealt a new hand, i.e. a new combination of genes. This is why when we want plants to “come true”, we propagate by cuttings and not from seed, and why new varieties often come from crosses.

A second source of variation is spontaneous mutation. I said above that the DNA sequence is copied exactly when cells divide. In fact, that's not quite true. Sometimes the cell makes errors; approximately one error every thousand million bases copied (try and find a typist that good!). What's more, most of these errors make no difference to the proteins that are made as the genetic code is quite resistant to errors. Nevertheless, occasionally spontaneous mutations are observed, either because of copying errors, or damage to DNA by UV light or cosmic rays, or due to a “jumping gene” (in scientific terms, a “transposon”), a sort of DNA parasite that hops around chromosomes and sometimes knocks out a gene by inserting itself in the middle of it. Some of you may have had the luck to spot a “sport” on one of your heathers or perhaps a “reversion”. Sports are usually due to spontaneous mutations and have been the source of many of the most popular heather cultivars. Reversions are often seen in the case of a gene that was inactivated by insertion of a transposon; when the transposon jumps again, the gene is reactivated. Cultivars renowned for frequent reversion such as ‘Ruth Sparkes’ or ‘Golden Lady’ may well carry a mutation of this type.

Many transposons jump in response to stress, so to avoid reversions, try not to stress your plants.

As one might expect, most random changes to a DNA sequence are more likely to mess things up than to create a new gene. (Imagine removing a word or two from this article at random; the resulting phrases are unlikely to make sense.) Unsurprisingly then, most mutants are missing a protein normally found in the wild plant because one of their genes no longer works properly. For example, red-foliaged *Calluna* cultivars lack one of the genes needed for correctly making chlorophyll; the reduction in the amount of green chlorophyll allows the other coloured pigments in the leaves to be seen. White-flowered heathers lack one of the genes for making purple anthocyanin pigments. Yellow-foliaged heathers like 'Beoley Gold' probably lack both of these genes. For the moment the function of most of the 20,000 genes in plants is unknown, but already some of those involved in processes that most interest gardeners are being studied.

FLOWER FORM

Simple flowers are composed of four whorls – the calyx (A), made of sepals, the corolla (B), made of petals, the stamens (C) and the ovary/style/stigma (D,E,F respectively) in the centre. Over the last few years it has been possible to identify some of the genes involved in establishing these whorls and determining which organs get made where. Most of the evidence comes from

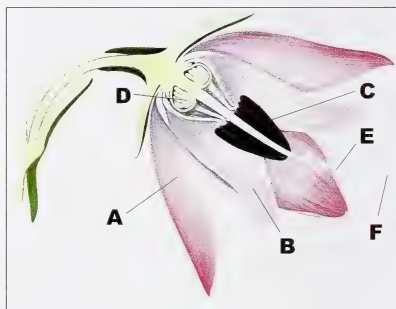


Fig. 1. Cross-section of *Calluna vulgaris* (A. H. Church, see p. 34)

Arabidopsis mutants, but work on snapdragon (*Antirrhinum*) shows that although it has very different flowers it uses many of the same genes to control the basic form of the flower. Therefore, although it will be a long time before anyone checks in detail, the model described in Fig. 2 probably applies to heathers for the most part. For simplicity, we will assume that three genes (here labelled A, B and C) are responsible for flower formation (in reality, many more genes are involved; the functions A, B and C are each the result of the action of multiple genes). Which genes are active determines which organs are made; A alone gives sepals, A+B petals, B+C stamens and C alone carpels. The activity of each of these genes is normally confined to particular whorls in the flower; A activity is confined to the outer two whorls,

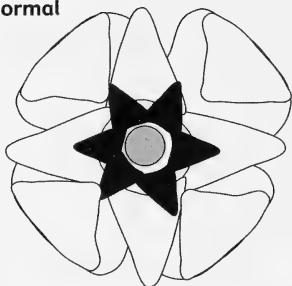
B activity to the middle two whorls and C activity to the central two whorls. A and C are mutually repulsive; A activity normally prevents C being active in the outer two whorls and C activity prevents A from being active in the inner two whorls. From this model, the effects of mutations in these genes can be predicted. Lack of A or B activity gives peculiar malformed flowers of little horticultural value, but lack of C activity gives an interesting result - stamens are converted to petals and carpels to sepals. This mutant resembles some double-flowered heathers (see Figure 3).

FLOWER COLOUR

Flower colours in heathers and most other plants are mostly determined by a set of pigments known as anthocyanins (from the Greek *anthos*, meaning flower, and *kyanos*, meaning blue). Despite their name, most of these pigments are red or purple in colour. Anthocyanins are made in a series of steps from colourless precursors. Each of these steps is catalysed by a different protein, and of course the blueprint for each of these proteins resides in a different gene. If one of these genes is no longer active due to a mutation, none of the anthocyanins depending on the protein made from that gene can be made and often the flower colour will change. If the missing protein catalyses one of the early steps in anthocyanin synthesis, the flowers are usually white as no coloured pigments can be made. If the missing protein catalyses a later step, the flower may be paler or darker, more or less red, etc. depending on which pigments can still be made.

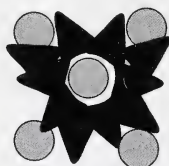
The variation of flower colour within species is considerably less than that observed between species. It won't have escaped your notice that there are no blue heathers for example. This is because all heathers lack the protein needed to make blue anthocyanins. However, a byproduct of the research into molecular genetics is that scientists now know how to introduce new genes into plants. In principle then, it should be quite possible with current technology to take the gene for blue flowers from delphiniums and put it into heathers. Given the enormous cost of this high-tech approach, we aren't likely to see genetically modified heathers anytime soon. Other plants with more market value are a different matter though. A blue rose has been estimated to be worth more than £1,000,000,000 a year for the first person to make one. It isn't surprising then that attempts have already started. The Australian company Florigene has been trying for ten years, so far without success. The problem is not the gene transfer, but rather the acidity of the petals. Anthocyanins make excellent pH indicators and like litmus paper turn red in the presence of acid and blue in the presence of alkali. Rose petals are acid, and even normally blue anthocyanins turn red in them. Florigene

normal



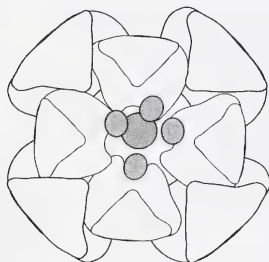
| | SEPAL | PETAL | STAMEN | CARPEL |
|---|-------|-------|--------|--------|
| A | ■ | ■ | | |
| B | | ■ | ■ | ■ |
| C | | | ■ | ■ |

lacks A (apetalous)



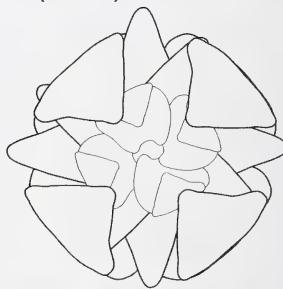
| | CARPEL | STAMEN | STAMEN | CARPEL |
|---|--------|--------|--------|--------|
| A | | | | |
| B | | ■ | ■ | |
| C | ■ | ■ | ■ | ■ |

lacks B (anandrous)



| | SEPAL | SEPAL | CARPEL | CARPEL |
|---|-------|-------|--------|--------|
| A | ■ | ■ | | |
| B | | | | |
| C | | | ■ | ■ |

lacks C (double)



| | SEPAL | PETAL | PETAL | SEPAL |
|---|-------|-------|-------|-------|
| A | ■ | ■ | ■ | ■ |
| B | | ■ | ■ | |
| C | | | | |

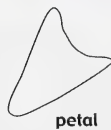
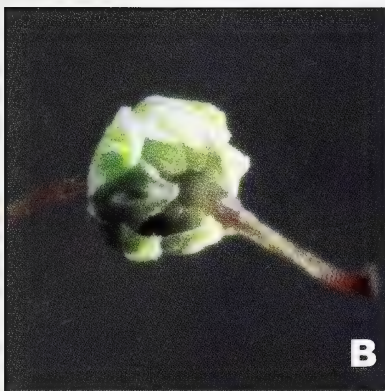
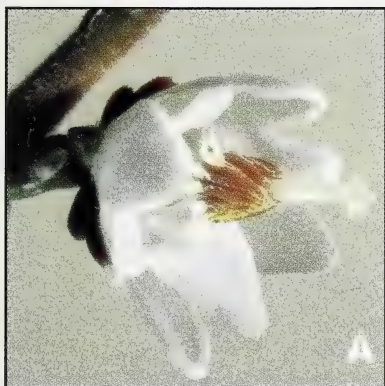


Fig. 2

Diagrammatic representations of idealized flowers (the slight resemblance to *Calluna* flowers is intentional). The tables indicate the expression patterns of the A, B and C activity genes in the four whorls of the flower. Top left, normal flower; top right, flower lacking A activity; bottom left, flower lacking B activity; bottom right, flower lacking C activity. This diagram is based on those in Meyerowitz (1994).



have had more luck with carnations carrying a gene for making the blue anthocyanin delphinidin taken from petunias; two violet carnations 'Moondust' and 'Moonshadow' should be on sale this autumn and we can expect other shades of "blue" next year.

OTHER APPLICATIONS OF MOLECULAR GENETICS

Molecular genetics techniques can also be used for identifying cultivars and species and studying the relationships between them. Many of you will have heard of DNA fingerprinting – the manner in which the police can now identify people from hair or blood or other body fluids left at the scene of a crime. Exactly the same technique can be used on plants with the same result.

Fig. 3

Close-ups of individual heather flowers (photography by Allen Hall)

A Typical single flower of *Calluna vulgaris* 'Spring Cream' (compare to top left diagram in Fig. 2)

B Anandrous variant of *Erica vagans* (compare to bottom left diagram in Fig. 2)

C Double flower from *C. vulgaris* 'Kinlochruel' (compare to bottom right diagram in Fig. 2). Big showy doubles like 'Kinlochruel' don't just have petaloid stamens, they also contain many more whorls than the normal flower. This may be due to a mutation in a second gene.

In fact, a murderer in Arizona was convicted due in part to evidence that a pine cone in the back of his pick-up truck came from the tree under which the victim had been buried. The match between the pine cone and the tree was made by DNA fingerprinting. DNA fingerprinting can easily distinguish different cultivars, and was an important part of the evidence used by Kurt Kramer to demonstrate that a rival nurseryman was illegally selling one of his cultivars under a different name. The same technique is frequently used in paternity cases, and again can be used in exactly the same way in plants. It should be relatively easy to identify the parents of crosses for example, or verify whether or not a particular cultivar is a hybrid. By counting DNA differences between different plants, an idea can be gained of how closely related they are. This approach is now widely used in evolutionary studies. Kathy Kron (Wake Forest University, USA) is currently attempting to study the relationships between European and South African *Ericas* using DNA sequencing and to place *Erica*, *Calluna* and *Daboecia* within the Ericaceae. At a higher level, a worldwide collaboration between scientists is attempting to use DNA sequence data to draw up the family tree for all green plants.

CONCLUSION

It is evident that advances in molecular genetics are going to transform society in one way or another over the next few decades. In the fields of medicine and agriculture the transformations have already started, rarely without controversy. What I hoped to do in this article is explain a little bit of the science behind the headlines and to point out that our gardens will change too. The increased understanding about how plants are put together coming from the plant science labs will benefit both the classical breeders and the genetic engineers. It will benefit the gardeners too; at least if you are as curious as I am, the knowledge of why a particular cultivar looks like it does adds considerably to the pleasure of watching it grow in the garden.

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A mixed-up heather – what is *Erica mackaiana* ‘Lawsoniana’?

E. CHARLES NELSON

Tippitiwitchet Cottage, Hall Road, OUTWELL, Wisbech, Norfolk, PE14 8PE.

One of the long-cultivated cultivars of Mackay's heath is called 'Lawsoniana', a plant known to Scottish gardeners, at least, in the early 1890s. Whence it came and when it was first propagated are far from certain.

The first detailed description of a plant then called *E. tetralix* var. *lawsoniana* by horticulturists was made by Dr J. Muirhead MacFarlane in a paper entitled "An examination of some *Ericas* collected by the Scottish Alpine Botanical Club in Connemara during 1890". 'Lawsoniana' had not been collected by the SABC in Connemara because it was already in cultivation. MacFarlane made the following observations:

But there is cultivated in gardens a form the exact origin of which I cannot trace, but which is named *E. Tetralix* var. *Lawsoniana*. Now, in every point of structure it is quite intermediate between *E. Mackayi* and *E. Stuarti*, the leaves as well as the sepals having non-glandular cilia. The corolla is tubular-urceolate, the anthers are tailed, the ovary is spherical or slightly depressed at the apex, and the style is strongly exserted.

One page later, MacFarlane described this plant as a subspecies of *E. tetralix*. The other subspecies, *sensu* MacFarlane, were *mackayi* (i.e. *E. mackaiana*) and *stuarti* (i.e. *E. x stuartii* 'Stuartii'). Botanists no longer regard this classification as acceptable; *mackayi* is recognized as a distinct species, *stuartii* (as known to MacFarlane) is merely a cultivar of the hybrid between *E. tetralix* and *E. mackaiana*. But what was MacFarlane's *E. tetralix* var. *Lawsoniana*?

MacFarlane's formal description of his subspecies reads as follows:

Sub-species 3. — *Lawsoniana*, Hort.; leaves slightly revolute, glabrous, and with long non-glandular cilia, stomatic hairs as in last [i.e. *mackayi*, stomatic hairs twice as long as in [*E. tetralix*]; sepals oblong, slightly constricted in middle, and with non-glandular cilia; corolla tubular ovate; ovary nearly spherical, glabrous; style strongly exserted.

He also illustrated the flowers of his subspecies. The diagram of *Lawsoniana* (MacFarlane 1893, figure 4c, (see Fig. 3, page 79)) shows a single corolla

with the sepals bearing numerous prominent, eglandular cilia. The corolla shape is closer to elliptical than ovate (= egg-shaped). The corolla mouth is wide (at least two-thirds of the maximum diameter of the corolla; contrasting with his *mackayi* which has a narrow mouth, only half the maximum diameter of the corolla), and through this opening the style with a capitate stigma is 'strongly exerted'.

PRESENT-DAY 'LAWSONIANA'

The clone of *Erica mackaiana* currently bearing the name 'Lawsoniana' is a very strange one. It is surprisingly variable, as I shall demonstrate, and is *not* in my opinion the same as the plant described by MacFarlane. I believe that had MacFarlane studied the clone that is grown nowadays under the name 'Lawsoniana', his description would have been substantially different.

I obtained flowers of 'Lawsoniana', by courtesy of David Small, from plants of this clone grown in the National Collection of heathers, at the Royal Horticultural Society's Gardens, Wisley, in late August 1999. I examined them while still fresh.

The flowers of present-day 'Lawsoniana' are pale pink; MacFarlane makes no comment on colour. The corolla is distinctly ovate, and not elliptical as shown by MacFarlane. The style is *never* exerted – this is obvious to the naked eye. Sometimes its tip may just been seen at the corolla mouth, but it never emerges beyond the mouth and certainly never pokes out as prominently as shown by MacFarlane.

Examining the clusters of flowers with a hand-lens (x 20) I noticed that the short hairs on the peduncles are sometimes glandular – therefore this clone cannot be classified as *E. mackaiana* f. *eglandulosa*. In this clone the bract at the mid-point of the peduncle closely resembles the ordinary leaves; they are broad, with marginal cilia, and prominent white under-sides. The other two bracts are held just below the sepals, and look more sepal-like. The sepals, often tinged dark red, have very few cilia; indeed, many have only a single terminal cilium. Occasional sepals have one or two (rather more than two) small vestigial cilia near the tip; these are shorter than the one at the tip. The sepals do not have the array of cilia drawn by MacFarlane.

Another most striking departure from the standard descriptions of any clone of *E. mackaiana* is the fact that 'Lawsoniana' produces a mixture of 4-lobed (83%) and 5-lobed flowers (15%), and, very rarely, even 6-lobed ones (4 out of 435), and a solitary 8-lobed flower (Figures 1 & 2). The 5-lobed flowers often had 9 (very rarely 10) stamens; the "correct" number of stamens is 8. The 8-lobed one had 10 stamens.

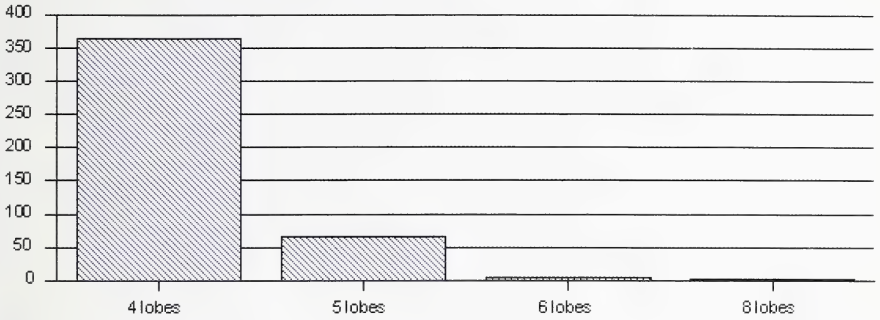


Fig. 1. Number of corolla lobes on individual flowers of 'Lawsoniana'

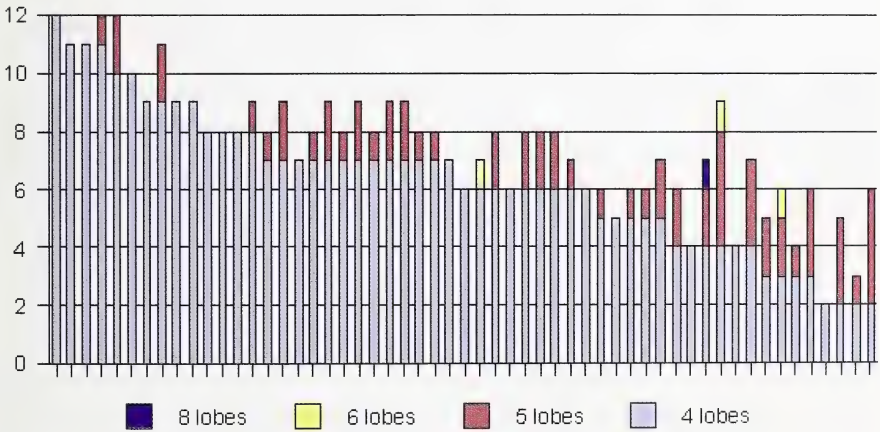


Fig. 2. Number of flowers per inflorescence/number of corolla lobes

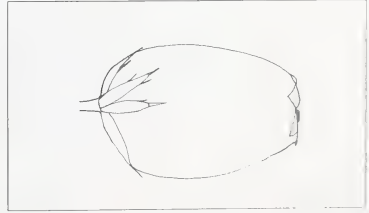
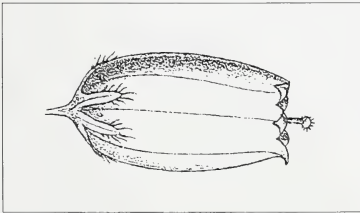


Fig. 3. (left) MacFarlane's illustration of 'Lawsoniana' (1893) and (right) present-day 'Lawsoniana' (drawn by the author)

The other notable characteristic is the malformed style. Not only is it usually *shorter* than the corolla, but it is often bent over near the apex, or in some cases split for all or part of its length into two or three unequal parts. The more usual condition is for the apex to be slightly expanded but never capitate – it does not resemble a pin, as shown by MacFarlane.

Finally, under no circumstances could the ovary of ‘Lawsoniana’ be described as spherical; it is distinctly cylindrical and usually has a depressed apex. It is entirely glabrous, so there can be no doubt that this clone belongs in *E. mackaiana* and not *E. tetralix*.

CONCLUSIONS

Examination of more than 400 flowers of the plant currently called ‘Lawsoniana’ demonstrates that it is another of the clones of *E. mackaiana* that displays abnormal floral structure. I would expect the white-flowered sport named ‘Dr Ronald Gray’ to have the same floral characteristics, but have not examined its flowers except in a cursory way (they do not have emergent styles). Plants with petaloid staminodes replacing the stamens (as in the cultivar ‘Maura’) and with a multiplication of staminodes (for example, the “double-flowered” cultivar, ‘Plena’) are well-known; these belong to *E. mackaiana* f. *multiplicata*. In ‘Lawsoniana’, however, there is no sign of the stamens being malformed; the filaments are never abnormally broad, and the anthers appear to be normal. They have very prominent, swept-back awns and appear to produce pollen.

The short and obviously malformed style is a characteristic that contradicts MacFarlane’s description. Another departure from his description – although only as shown in his figure 4c (see Fig. 3, p. 79) – is the sparsity of cilia on the sepals. The corolla shapes are also different – elongated and elliptical in MacFarlane’s account, but ovate in the flowers I have examined.

Given MacFarlane’s relatively complete description, accompanied by an illustration, I have to conclude that the clone now grown under the name ‘Lawsoniana’ is *not* the same as that known to Scottish gardeners a century ago. But what is it? What should its name be? And, where did it come from?

I cannot answer these questions at the moment.

Reference

MacFARLANE, J. M. 1893. An examination of some *Ericas* collected by the Scottish Alpine Botanical Club in Connemara during 1890. *Transactions of the Botanical Society of Edinburgh* **19**: 58-64, plate I.

Heathers from Spain and Portugal in Charles de L'Écluse's works

L. RAMÓN-LACA & R. MORALES

Real Jardín Botánico, C.S.I.C., Plaza de Murillo 2, E-28014 MADRID, Spain

Among the well-known trio of sixteenth century Flemish herbalists – Clusius, Dodonaeus and Lobelius – Charles de L'Écluse (born Arras, 1526; died Leiden, 1609), commonly known under his Latinized name Clusius, stands out as the most important personality in the panorama of European Renaissance botany.

Although he suffered fragile health, L'Écluse devoted his entire life to the study of plants in a very particular manner that clearly broke away from the traditional role of physicians as herbalists (Ogilvie 1997: 92).

Between 1564 and 1565, as a mentor of the young Jacob Fugger, L'Écluse carried out an extensive trip through the Iberian Peninsula, visiting Andalusia, Castile, Extremadura, Granada, Murcia, Valencia and Portugal (Hunger 1927). This was the first time in the history of botany that a specific territory had been intensively explored. L'Écluse collected specimens and general floristic information.

L'Écluse's *Rariorum aliquot stirpium per Hispanias observatarum historia*

The result of the expedition to Spain and Portugal was a book entitled *Rariorum aliquot stirpium per Hispanias observatarum historia* (*The history of some remarkable plants observed in Spain*). This little volume – measuring just six inches by four inches – was printed in 1576 in Antwerp by the famous company De Gulden Passer (The Golden Compass) of Christoffel Plantin – the Officina Plantiniana (Nave & Imhof 1993: 112). It must be considered as a true masterpiece in the history of botany. Most of the plants contained in it were – using the words of L'Écluse – unknown at that time or had been poorly described. In his prologue, L'Écluse (1576: 7) explained how he took notes and drew sketches, as well as his methods of collecting and drying specimens of plants – more than 300.

The book is divided in two parts: the 'liber primus' (first book) – 244 pages, 65 chapters and 100 figures – contains mainly trees and shrubs, and the 'liber secundus' (second book) – pp 245–509, 102 chapters and 125 figures – deals with bulbous and herbaceous plants. It also includes an appendix – pp 509–529, 6 chapters and 8 figures – dealing with remarkable plants from Thrace (Greece and the European part of Turkey), among them the tulip.

| L'Écluse's name | Spanish and Portuguese names | Current scientific name |
|--------------------|--------------------------------------|--|
| Ericæ Myricæ folio | Sp. quirihuëla, Port. queiro | <i>Calluna vulgaris</i> (L.) Hull |
| Ericæ Coris folio | | <i>Erica</i> L. / <i>Corema</i> D. Don |
| E. C. f. I* | Port. atorga | <i>Erica lusitanica</i> Rudolphi |
| E. C. f. II (1)* | | <i>Erica australis</i> L. |
| E. C. f. II (2) | | <i>Erica multiflora</i> L. |
| E. C. f. III* | | <i>Erica erigena</i> R. Ross |
| E. C. f. IIII (1)* | Port. urs, urgueira, Sp. breço | <i>Erica scoparia</i> L. |
| E. C. f. IIII (2) | | <i>Erica carnea</i> L. |
| E. C. f. V* | | <i>Erica umbellata</i> Loefl. ex L. |
| E. C. f. VI* | | <i>Erica cinerea</i> L. |
| E. C. f. VII* | Port. camarinhera (fruit camarinhas) | <i>Corema album</i> (L.) D. Don |
| E. C. f. VIII* | Port. lemerinha | <i>Erica ciliaris</i> Loefl. ex L. |
| E. C. f. IX* | | <i>Erica australis</i> L. |

Table 1: Identities of heather in *Rariores aliquot stirpium per Hispanias* (1576); *indicates an illustration is present (see Fig. 1, p. 84 this issue).

The same scheme is followed for all plants. Information from ancient authors, such as Dioscorides, Pliny or Collumela, is incorporated with a description of each species including the flowering period and other details, the places were they occur, their names in different languages, and when relevant their curative properties.

Heathers in *Rariorum aliquot stirpium per Hispanias observatarum historia*

Following the opinions of Dioscorides and Pliny, L'Écluse (1576: 107–120) distinguished two different “genera” of heathers: *Erica Myricæ folio* corresponding to *Calluna*, and *Ericæ Coris folio*, divided in nine species which equate with *Erica* and *Corema*. It is remarkable how the distinction between “genus” and “species” is made in this venerable book. This concept possibly inspired the work of Linnaeus, who often referred to L'Écluse in his *Species plantarum*. At the same time, L'Écluse made use of diagnostic characters in the sense that we use them today; for example the appearance and the colour of the leaves and the flowers.

Regarding the first genus – *Erica Myricæ folio* – L'Écluse mentioned that this was similar to “myrica”. Dioscorides and Pliny had already pointed out the similarity between ἐρέιχη(“erica”) and μυρική(“myrica”). According to L'Écluse, this genus was especially common in northern regions, in untilled places. It rarely exceeded the height of one cubit (= about 18 ins.) and the flowers were pale purple although sometimes they were white. The fact that the plant bloomed twice a year, in Spring and especially – as underlined by L'Écluse – in Autumn, points clearly to *Calluna vulgaris*.

L'Écluse explains how he found a plant like this near the royal palace at Windsor, (England) although it was a little taller, had tomentose, whitish leaves and paler flowers.

From L'Écluse's point of view, the second genus – *Ericæ Coris folio* – did not resemble “myrica” but was similar to “coris”, especially its leaves. As noted, L'Écluse divided this genus into several species.

The first species surpassed, at times, the height of a man. Its flowers were like little cymbals and it grew in isolated places in Portugal between Lisbon and Coimbra. L'Écluse had found it in the valley of the river Tagus, ten miles from Lisbon. This plant bloomed in November and December, which considered together with the engraving (Figure 1), leads us to suggest it was *Erica lusitanica*, not *E. arborea*, which flowers at a quite different period.

The second species had more or less the same height as the first, but the colour of the flowers was deeper. This has to be *E. australis*. Another, similar species was frequent in the region of Narbonne; it was a little taller and had more abundant leaves, while the flowers were smaller and purple. According to L'Écluse this heather matched the engraving included in the commentaries on Dioscorides by Pietro Andrea Mattioli (1559: 108-109). Taking into account the fact that Mattioli saw it in Gorizia (between Italy and Slovenia), by the river Vipava, this figure seems to represent *E. multiflora*.

The third species was very similar to the first two, but a little more stunted. It was, like the first, frequent about Lisbon and in many other places. It bloomed in December and January. This must be *E. erigena*.

The fourth heather reached the height of two cubits, and was sometimes even taller. L'Écluse remarked how this plant was widespread in Spain, Portugal and Aquitaine. It was also dominant in isolated and untilled places around Bordeaux, where nothing could be seen except its low shrubby vegetation. It is noteworthy that L'Écluse stressed that this particular heather was well known around Narbonne, where it was used to make brooms. It flowered in Spring and during Winter. He was clearly referring to *E. scoparia*.

The fifth species was smaller than the fourth and frequent in untilled places around Lisbon. It flowered in December. This is *E. umbellata* (Figure 2).

L'Écluse observed the sixth heather not only in Old Castile but also in France, near Paris, and in England at Windsor. It bloomed in September. This is *E. cinerea*.

He saw the seventh species everywhere in Portugal, for example not far from Lisbon, between Riofrio and Aldea Galega, and also around Lisbon in sandy soil. The ecology of the species, and the engraving clearly indicate *Corema album*.

Erica lusitanica*Erica australis**Erica erigena**Erica scoparia**Erica umbellata**Erica cinerea**Corema album**Erica ciliaris*

Fig.1 Erica I, II, III and IIII (upper) and Erica V, VI, VII and VIII (lower) from *Rariorum aliquot stirpium per Hispanias observatarum historia* (1576). The present authors' identifications are printed alongside each engraving.



Fig. 2 Libri picturati A.20–31 showing L'Écluse's Erica VII (left), I (upper right) and II (lower right)

L'Écluse's eighth heather was found on most occasions with the seventh. It bloomed in October. This is *Erica ciliaris*.

The ninth heather was not scarce in Old Castile, particularly around the hillock known as the Peña de Francia (Salamanca). The colour and the shape of the flowers compare with *E. australis*.

Habitually, L'Écluse provided the names in different languages: Greek ἐρείκη, Latin *Erica* and *Erice*, French bruyère, and Flemish beyden. The first genus was called quirihuëla in Spanish and queiro in Portuguese. With regard to the other genus, the first species was named atorga in Portuguese; the fourth was called urs and urgueira, and breço (nowadays brezo) in Spanish; in Portuguese the seventh was named camarinha and its fruits camarinhas; the eighth was known in Portuguese as lemerinha.

L'Écluse finished his commentaries on heathers by referring to some of their medicinal properties:

The liquid from the leaves of the heather restores the eye's weakness if it is instilled into them. I remember seeing, while I was in the region of Montpellier, how the use of flowers of heather by the illustrious D. Guillaume Rondelet was a great success ... (L'Écluse 1576: 120)

HEATHERS IN THE LIBRI PICTURATI A.16-30

A number of illustrations in the outstanding collection of sixteenth century natural history drawings known as the *Libri picturati* A.16-30, today kept at Biblioteka Jagiellonska in Kraków, were used by the Officina Plantiniana as the templates for the engravings published in L'Écluse's works (Whitehead *et al.* 1989; Wille 1996, 1997; Swan 1998; Zemanek & Koning 1998).

In the case of the heathers, six of these drawings match the engravings in *Rariorum aliquot stirpium per Hispanias observatarum historia*: L'Écluse's *Erica* I, II and VII (Figure 2) correspond to the drawings on f. 31 recto of *Libri picturati* volume A. 20, while *Erica* III, V and VIII to the ones on f. 31 verso.

The size of the sheets (17° x 12° ins.) and the watermark – two arrows and a star (Briquet 1923: 362 nr. 6299, Labarre 1953: nr. 1230) – allow us to identify the paper as the 'reale' format made at Fabriano (Italy) in 1554.

Folios 28 and 29 in the same volume of *Libri picturati* also contain heathers, although in these case they were not used for any engraving in *Rariorum aliquot stirpium per Hispanias observatarum historia*. These two folios were annotated by L'Écluse:

[f. 28] ERICA | Diosc. lib. 1. cap. 100. | Plin. lib. 24. cap. 9. | Galen. lib. 6. simp. medic. | Nascitur in campestris. et sabulosis collibus: | silúosis item gaudet. | Floret bis in anno: primo scilicet vere et autúmno.

[f. 29] ERICA ALTERA seu MAIOR | Nascitur eisdem quibus prior locis: Florétq. eodem tempore.

| Species | Port. | Spain | General distribution | Flowering period |
|---|-------|-------|----------------------|---------------------|
| <i>E. andevalensis</i> Cabezudo & J. Rivera | | SW | | VI-XI |
| <i>E. arborea</i> L. | X | X | Med, N & E Afr | II-VII |
| <i>E. australis</i> L. | X | X | Mo | (X) I-V |
| <i>E. ciliaris</i> Loeff. ex L. | X | X | Ir, GB, F, Mo | V-IX (XII) |
| <i>E. cinerea</i> L. | X | X | W & C eur, Mac | (IV) VI-IX (X) |
| <i>E. erigena</i> R. Ross | X | X | Ir, F | (IX-XII) I-IV (VII) |
| <i>E. lusitanica</i> Rudolphi | X | NW | F | (XI) XII-III (IV) |
| <i>E. mackaiana</i> Bab. | | N | Ir | VII-IX (XI) |
| <i>E. multiflora</i> L. | | X | Med | VIII-I (III) |
| <i>E. scoparia</i> L. | X | X | W Med, Mac | V-VII |
| <i>E. terminalis</i> Salisb. | | SE | It, Co, Sa, Mo | (IV) V-VIII (IX) |
| <i>E. tetralix</i> L. | X | X | W & N Eur | (IV) V-IX (XI) |
| <i>E. umbellata</i> Loeff. ex L. | X | X | Mo | II - VII |
| <i>E. vagans</i> L. | | X | Ir, GB, F | VII-IX (X) |

Table 2: Heathers native to the Iberian Peninsula

(F = France, GB = Great Britain, Ir = Ireland, It = Italy, Co = Corsica, Sa = Sardinia, Mo = Morocco, Afr = Africa, Eur = Europe, Mac = Macaronesia, Med = Mediterranean Region).

HEATHERS IN JOHN GERARD'S *THE HERBALL* (1633)

In an earlier *Yearbook*, Nelson (1998: 40) pointed out that most of the heather illustrations in Thomas Johnson's edition of John Gerard's *The Herball* (1633) are identical to those in L'Écluse's book. The illustrations were not based on English plants, but – as shown by the text of *Rariorum aliquot stirpium per Hispanias observatarum historia* – on Spanish and, principally, Portuguese plants.

Thus it is now possible to confirm most of the identifications of the heathers in Johnson's edition of *The Herball* previously suggested by Nelson (1998). The fact that most of them remain unchanged speaks clearly of the quality of the wood blocks used by the Officina Plantiniana.

HEATHERS NATIVE TO SPAIN AND PORTUGAL

According to Bayer (1993), 14 species of heathers occur naturally on the Iberian Peninsula – Portugal and Spain excluding the Canary Islands. Only four additional species are cited for the rest of Europe and the Mediterranean area: *E. carnea*, native to central and southeastern Europe; *E. bocquetii* from Turkey; *E. manipuliiflora* from the eastern Mediterranean; *E. sicula* in Sicily and Libya as well as in the eastern Mediterranean (Webb & Rix 1972; Greuter *et al.* 1986).

It is remarkable that L'Écluse described eight species from the Iberian Peninsula. In his Hungarian and Austrian flora (*Rariorum aliquot stirpium, per Pannoniam, Austriam, & vicinas quasdam provincias observatarum historia*: L'Écluse 1583), four more heathers were described: while *Erica* I corresponds clearly to *Empetrum nigrum*, *Erica* II, III and IV seem to us to be *Erica carnea*.

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ACKNOWLEDGMENTS

We must express our gratitude to Dr Charles Nelson, who kindly invited us to write this paper.

The change in the legal status of *Erica ciliaris* L. Dorset heath in Ireland

T. G. F. CURTIS

Research Branch, National Parks & Wildlife, Dúchas The Heritage Service,
7 Ely Place, DUBLIN 2, Ireland.

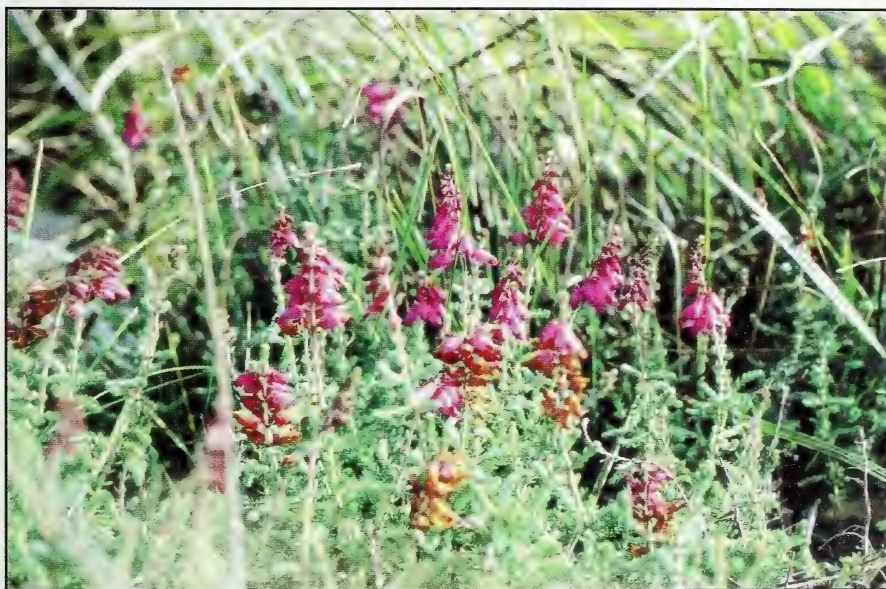


Fig. 1. *Erica ciliaris* in Connemara (E. C. Nelson)

Section 15 of the Irish Wildlife Act (1976) enables the competent authority – in this case, Dúchas The Heritage Service – to compile Flora Protection Orders listing species of flora most obviously in need of protection. Three such orders have been made in 1980, 1987 and 1999. The first two contained only species of vascular plants but the 1999 Order is an advance in that some cryptogamic plants are listed for protection for the first time and a selection of charophytes, bryophytes and one lichen are included on the current Statutory Instrument No. 94 of 1999.

An imperative prerequisite of listing species on any edition of a Flora Protection Order is that the basis for inclusion is rigorously scientific. In

general, in Ireland and elsewhere, protected status is accorded only to those taxa which are demonstrably rare and threatened and these species are a subset of a larger group which are termed "Red Species". This designation is given in Ireland to those taxa which are found in fewer than ten 10km squares, or which have declined more than 66% since 1970 on the basis of their 10km square distribution. In 1988 *The Irish red data book: 1 Vascular plants* listed 159 taxa which satisfied at least one of these criteria. Following accepted international practice, first established by the International Union for the Conservation of Nature, *Red data book* species were categorised as Extinct, Endangered, Vulnerable, Rare or Indeterminate. The inclusion of a taxon on the 1987 Flora Protection Order, which was published in conjunction with *The Irish red data book*, was, however, restricted to plants in the Endangered category that were restricted to one site only, or that had shown a catastrophic decline in distribution since 1970. *Erica ciliaris* qualified on the second criterion and its overall status assessment was Vulnerable.

However, one unstated criterion presupposes every other: that the taxon in question is native to Ireland. Now, given that the landscape of Ireland, and consequently the vegetation and flora, has been subjected to huge modification by humans for at least 8,000 years, it is sometimes very difficult to establish, with absolute certainty, the native status of certain species. Some plants may have been very old, unwitting, introductions which managed to establish themselves and maintain their populations either through the standard reproductive methods of seed production and/or vegetative spread. *Erica erigena* may be a good example of such a species (see Foss & Doyle 1990). And, there are exemplars of this class on the current 1999 Flora Protection Order in the poppy *Papaver hybridum* and the lesser snapdragon *Misopates orontium*, both associated with the cultivation of crops, and possibly the Kerry lily *Simethis planifolia*. What cannot be accommodated on the Flora Protection Order are those species which have been deliberately planted; to do so would demean the scientific and legal status of the Order.

The removal of the Dorset heath, *Erica ciliaris*, from the Flora Protection Order of 1999 may have surprised heather specialists and other botanists as it was listed on the original Order of 1980 and again in 1987. Most readers will know that the species is confined to one site in Ireland in Connemara. The small colony contains maybe a dozen plants, and all of them appear to be identical in morphology (Nelson 1982). The plants never seem to set seed (Webb & Scannell 1983). However, the colony has apparently persisted at the site since it was first discovered there in 1846 by Thomas Bergin (Eager *et alii* 1978).



Fig. 2. Habitat of *Erica ciliaris* in Connemara
(E. C. Nelson)

Curtis & McGough (1988) were of the view that the species occurred so close to a road margin as to suggest that it may have been planted there. In the interim, nothing has indicated to me that this view should be altered. Indeed, during the recent detailed surveys carried out by Dúchas The Heritage Service of the Connemara Bog Complex, which is being proposed as a Special Area of Conservation under the Habitats Directive programme of the European Union, no further colonies of this species were discovered. Why this should be the case, when there is an abundance of suitable habitats in the vicinity, is unknown but it does suggest that an original introduction was effected through planting – it is just too close to the road to believe otherwise. And, its single biotypic, perhaps even

clonal, nature further strengthens that view. Of course, we may never know its full history and it really comes down to a difference of opinion. But, the critical matter for me, as the person within Dúchas charged with making recommendations for protecting plants through Flora Protection Orders, is that there is an uncertainty, which from a legal viewpoint makes it a weak case for protection. Dúchas has to be in a very strong position to be able to go to court either to initiate a prosecution or to defend its listing of any species on the Order. And, a number of recent court cases have emphasised the need to be certain about the status of a species before including it within a legal instrument. A major criterion must be that there is no doubt that a species was not a deliberate introduction and in the case of *Erica ciliaris* in Connemara that doubt exists. This was the reasoning behind the decision to omit it from the 1999 Flora Protection Order.

Of course, excluding it from the 1999 schedule does not mean that Dúchas would be happy to see the loss of the species from Connemara. As

already mentioned, the colony exists within the candidate Special Area of Conservation and the species' survival is assured as a consequence of the need to protect the entire habitat. And, whether or not this heather was a planted introduction, it is still a fascinating piece of botanical history, a testament to the persistence of plants and a piece of contemporary culture we should not be without.

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THE HEATHER SOCIETY'S PROCEEDINGS

President's introduction

We are losing out on publicity. There seems to be much less in the press or books than there was not long ago, or have I failed to see or hear of items? In any event we do like to be told of anything you come across; and bestir yourselves to contribute something: many publications welcome such initiative. Daphne Everett has kindly offered to act as Press Officer for the Society but she needs your help.

There was a good chance during the tour based in Falmouth. David Small has managed to collect a full set of the cultivars deriving from the Lizard and all the existing forms of its unique hybrid, *E. x williamsii*. One such set was presented to officers of the Cornwall Wildlife Trust for their nature reserve at Allet, north of Truro; and two sets were ceremoniously handed over to the Earth Station Leisure Centre at Goonhilly, a suitably central location. They had beds ready for them and a photo duly appeared in the local press. That should show the many visitors to that informative exhibition how good and varied the local heathers are.

And how was this arranged and the actual plants brought down? The man who did this essential work was Barry Sellers. We are most grateful to these two officers for so successfully achieving this at relatively short notice. I hope members will try to get to see these plantings and ensure that they are kept up to the mark; tell others to go and see them.

Finally, there is the trip to Germany, which should foster publicity. It will be a unique millenium occasion, bringing together all four Heather Societies, It is not too late to get in touch with Diane Jones to ensure our Society is properly represented, and to seize the chance to get to know other like-minded people. The venue is special. You should enjoy it all.

DAVID McCLINTOCK
President, The Heather Society

**29th Annual Conference
St Michael's Hotel, Falmouth, Cornwall
10–13 September 1999**

The 1999 Annual Conference was held at the very well-appointed St Michael's Hotel which has commanding views over Gyllyngvase Beach in Falmouth.

Our Chairman, David Small, opened the Conference on the Friday evening and outlined the programme for the weekend. Ron Cleevely introduced the first talk, which was given by Keith Spurgin, a knowledgeable Cornish botanist and joint author of the latest supplement to the *Flora of Cornwall*. Keith Spurgin introduced himself in Cornish, explaining that this Celtic language was now spoken only by about 100 Cornish people. Apart from its language, there are other characteristics, especially its geology, that separate Cornwall from the rest of Great Britain, and which have given rise to its flora. In addition, he pointed out that there is also a big difference between the landscapes of north and south Cornwall. The former is characterised by steep cliffs, and the latter by a drowned river landscape known as *rias*. Volcanic thrusts had contributed by uplifting past landscape when forming the *torres* or granite outcrops that are a rich source of minerals, tin, silver and gold.

In describing the history of discovery of the Cornish flora Mr Spurgin paid tribute to the work of F. H. Davey who, in 1909, produced *Flora of Cornwall*. As a prelude to this work, Davey had published a *Tentative list* (1902), which he sent out to people seeking their assistance in providing botanical information for his intended major flora. Much earlier, in 1670 the Revd John Ray had named a heather found in Cornwall, the Cornish Heath, *Erica vagans*. Consequently, although *E. ciliaris* was discovered on The Lizard long before it was found growing in Dorset, it could not be given the name Cornish Heath, and so was named the Dorset Heath after its other major habitat in Great Britain. Mr Spurgin also referred to two hybrids, *Erica ciliaris* x *tetralix* (*E. x watsonii*), named after H. C. Watson, and Britain's rarest heather, *E. tetralix* x *vagans* (*E. x williamsii*) named after P. D. Williams in 1909.

Saturday 10 September 1999

After breakfast the Chairman welcomed Alistair Rivers, who gave a talk on the gardens of Cornwall. The major gardens of Cornwall arose in the early nineteenth century when wealthy London families sought country residences in the south-west. This had coincided with a resurgence in architecture, led

by the Prince Regent, and also the arrival of the railways which encouraged a desire to travel. He explained that originally these gardens were designed to cater for maybe 100 to 150 people, but nowadays visitor numbers are much higher, and the resulting pressure has led to changes in the specification and sizes of paths.

These houses were primarily built to provide a country residence during the Spring, and, consequently, the gardens were stocked with plants that blossomed and gave greatest impact during this season. A key factor in choosing Cornwall for their country houses was the area's favourable climate. Ambient winter temperatures are around 9°C (45°F), with the summer ones about 20°–21°C (68°–70°F). Frosts are rare, and when they do occur are not normally damaging. Rainfall is high, around 1800cm (72inches) per year. Therefore there is a long growing season, enabling plants cultivated in Cornwall to attain greater extension growth than elsewhere in the United Kingdom.

Most of the large houses were built on Cornwall's south coast. This trend too was influenced by geology; the steep cliffs of the north were avoided, while the drowned valleys of the south were easily accessible. Generally the soil in Cornwall has a pH of 5.5 and consists of a well-drained loam-clay, around 20cm (8 inches) deep, known as shillot. Nowhere in Cornwall is further than 25km (15 miles) from the sea, and as salt is deposited up to 13km (8 miles) inland, the salt-tolerance of plants is an important factor in selecting what to grow.

The families of the wealthy estates could afford gardeners and plant hunters. The first introductions of *Magnolia* were at Trewithen and Lanhydrock, and of *Rhododendron* at Heligan and Trelissick. Inevitably, there was considerable rivalry between families, and this led to the pursuit of better varieties and hence the development of hybrids. There was much secrecy over this and few records were kept. The Williams family were the first to introduce *Camellia* hybrids. *Camellia* species and cultivars imported from China, Japan and the Himalaya were originally considered tender, but the *C. reticulata* hybrids (including *C. x williamsii*) are robust and well-suited to the Cornish climate.

The Veitch family in Devon were also sponsors of plant hunting expeditions. Syndicated plant collecting was popularised whereby families named particular species and varieties of plants to be sought and collected. Plants were brought in from many parts of the world, particularly Australia and New Zealand. Treseder's, for instance, established a nursery in Australia to bring tree ferns (*Dicksonia antarctica*) to the United Kingdom market. Saffron was originally grown in Cornwall, but now comes from Turkey, yet,

surprisingly, Cornwall exports more daffodils to Holland than any other locality.

After Mr Rivers' talk, Howard Kernow, Vice-Chairman of the Cornwall Wildlife Trust, arrived wearing a splendid, traditional Cornish tartan kilt. He graciously received a collection of heathers that originated from The Lizard, from our President, David McClintock, as a gift from The Heather Society. In thanking the Society, he said the Trust was delighted to be able to plant this representative collection at its headquarters at Allet, Truro.

Then we boarded a coach for a visit to The Lizard, led by Keith Spurgin, to see examples of the native flora, to view *E. vagans* and to search for *E. x williamsii*. Our first stop was at Kynance Cove, where we were joined by a representative of The National Trust. We set off across the heathland covering the top of the cliffs before walking down to the Cove. We saw the wild leek with large flower-heads containing flowers and bulbils known as Babington's leek (*Allium babingtonii*), and a few plants of bloody crane's-bill (*Geranium sanguineum*) and dropwort (*Filipendula vulgaris*) were still in flower. The special interest of our guide in the numerous species of *Rubus* that can be found in Cornwall was revealed when he pointed out various plants. After admiring the picturesque coastline, a few members ventured to the sea-shore whilst other sought samples of the serpentine rocks. The group then moved on to the Lizard Downs area, the location of one of the more recent hybrid discoveries. Despite the dull chilly weather about an hour was spent searching for the elusive *E. x williamsii*. Scattered huddles of bent-over backs were soon dotted throughout the heather and gorse; occasional calls for expert opinion were soon dampened by dismissive rejection. It was eventually 'discovered' through the diligence and expert eye of Barry Sellers, but unbeknown to the finder, the same plant had actually been discovered by Jean Julian on the previous day when a group had been out on reconnaissance. On this occasion it was slightly easier to spot as some of the encroaching grass had been removed, allowing it to stand out from the *E. vagans* and *E. tetralix*. *Calluna vulgaris* and *E. cinerea* were also much in abundance. Jean's find is only the twelfth plant of this rare hybrid that had been noticed in 140 years. We all returned to the coach content that we had seen this elusive heather, and a new one too!

After lunch and shopping at Lizard Village, we set off for Traboe Cross where Keith Spurgin showed us the indigenous flora of that part of the peninsula. Some members of the group tried to find the original plant of *E. x williamsii* 'Croft Pascoe', but realised that there had been some recent



Presentation by our President and Chairman to Matty Elkins, BT Earth Station, Goonhilly of named heathers found on the Lizard peninsula.

Photo: Colin Ross

disturbance (eclipse watchers!) to the heathland in the presumed location. This plant is probably 'lost'.

Later, we were welcomed to British Telecommunications Earth Station, Goonhilly, by Matty Elkins, marketing officer at the Earth Station Visitor Centre. For the second time that day the Society made a present of a collection of Lizard heathers, this time to the Visitor Centre. These collections comprise 26 cultivars, either originally found growing wild on The Lizard, or progeny of these Lizard plants. Barry Sellers had suggested the location for the collections, following his reconnaissance trip to Cornwall to identify potential sites a few weeks prior to the Conference. The Visitors Centre fitted the criteria in that it is situated on The Lizard peninsula close to the sites of the original finds, is surrounded by natural heathland (purchased by English Nature in 1976 as Cornwall's first nature reserve), and is visited by large numbers of people between April and October every year. Moreover, the collection could be maintained. After tea the President, David McClintock, and the Chairman, David Small, presented Matty Elkins with the collections of heathers. The

heathers were planted on the following Monday, under the careful supervision of Albert and Jean Julian, who had kindly offered their services. In expressing thanks for the heathers, the Visitors Centre offered The Heather Society more space within the landscaped grounds for further planting, and asked if the Society would be willing to donate the plants. To commemorate the presentation of the Lizard heathers, a plaque will be put in place for the Spring 2000.

After dinner that evening, members gathered for the Annual General Meeting. The Chairman reported that the Society's membership had continued to decline, and that he was anxious to stem this and recruit new members. An optimistic note was that the Internet, via the Society's website [see pp 22–24], had produced 15 new members. He also emphasised that the Society needed to produce publications that would serve to attract new members. Our obligation to publish the *International Register of Heather Cultivars* was of highest importance. Thanks to a grant of £4,500 from the Stanley Smith Horticultural Trust progress on this was now assured. The Chairman reported that Dr Charles Nelson has been tirelessly examining records and that good progress on the *Register* database had been made. It is hoped that the final printed *Register* will be ready by August 2000. A number of other publications, including a booklet listing 100 recommended heathers, were almost ready. These would complement the *Handy guide*. Ron Cleevly (Honorary Secretary) and Allen Hall (Honorary Treasurer) gave their usual thorough reports on the Society's affairs and business accounts.

It was confirmed that next year, 2000, the first International Conference would take place in Elmshorn, Germany in August. This was fitting in the "millennium year" and reflected the international make-up of the Society which now had members on all continents.

David McClintock then sprang a surprise by presenting David and Anne Small with registration certificates for cultivars of *E. umbellata* that The Heather Society had registered and named in their honour: *E. umbellata* 'David Small' (pink flowers) [illustrated in *Yearbook of The Heather Society* 1999: 10], and *E. umbellata* 'Anne Small' (white flowers). Hardly had these two stalwarts of our Society overcome their shock, than they were kept in their places for the presentation of a homebaking machine by Professor John Griffiths, on behalf of the Yorkshire Group, to acknowledge their assistance to the Group and their outstanding achievements and dedication to The Heather Society.

Sunday 12 September

After another full breakfast members gathered for a talk by Dr Judy Rose of Horticulture Research International (HRI). She spoke about the development of lime-tolerant Ericaceae. HRI is conducting experiments at West Malling, and other places, in three main areas: breeding for lime-tolerance; other work on lime-tolerance; biotechnology. Dr Rose stressed that they had first to set out the aims of the breeding programme for lime-tolerance. The selection of parent plants known to have some tolerance of lime was important for any hybridisation programme. The viability of pollen was a key factor in the success of any hybridisation. Great care was required in transferring pollen as self-pollination may result. Once the ovaries ripened, seed could be collected and sown. Germination normally takes place within weeks. Seedlings must be re-potted and examined to see if any hybridisation has taken place. If successful, trials will need to take place. Of particular interest was Dr Rose's experiment to produce a cross between *E. carnea* with *E. cinerea* and it will be interesting to see whether this is authenticated, and whether the resulting plants are lime-tolerant. She also discussed the experiments involving the production of lime-tolerant rhododendrons that could be grown in soils of pH 7 or higher. *Rhododendron augustinii* 'Electra', 'Cunningham's White', *R. lutescens* 'Bagshot Sands' and 'Pictum' were involved in these trials.

After coffee we set off to visit the gardens at Bosvigo and Pine Lodge. Both gardens have been developed for 'out-of-season visitors' to Cornwall. Bosvigo is a private garden on the outskirts of Truro owned by Wendy and Michael Perry. It comprises a series of walled gardens arranged around a dramatic sloping site. Of particular interest were the 'black' and 'white' gardens, containing plants selected for their foliage and flower effect. The annual *Hibiscus*, suited to a frost-free location, has been grown at Bosvigo for the past ten years. After consuming our packed lunches we moved to Pine Lodge, situated near St Austell, a private garden owned by Ray and Shirley Clemo. They greeted us and gave us a brief history and description of the garden which began as a two-acre garden. Ray and Shirley Clemo moved there in 1976, and now garden about six acres. Pine Lodge is set within 30 acres of parkland, and contains more than 6000 plants including shrubs and herbaceous perennials. There is a water garden, marsh garden and wildlife pond. A Japanese garden is currently under construction. Our hosts kindly provided tea and biscuits.

That evening, at dinner we were treated to wine generously donated by Eileen Petterssen, and this ensured the right ambience for the customary 'Open Forum' that closed this most rewarding conference.

BOOK REVIEWS & RECENT PUBLICATIONS

LACK, H. W. & MABBERLEY, D. J. *The Flora Graeca Story, Sibthorp, Bauer and Hawkins in the Levant*. Oxford: OUP. Pp xxvii, 325; colour plates, monotonies, line drawings, maps. ISBN 0-19-854897-4, £250.

Flora Graeca Sibthorpiana is one of the most beautiful and remarkable books ever published. Each complete copy consists of ten volumes, issued in 20 parts, comprising letterpress with 966 coloured plates. Although not more than 25 copies were produced initially, the work involved was prodigious. 24,150 individual plates, each one a work of art in itself, had to be prepared by hand and that took 34 years; publication commenced about November 1806 and the last part was issued in November 1840. Maybe a further 40 copies were produced in 1847 but, even so, this was, and is, an extremely rare book.

One of its glories – *primus inter pares* – is the set of the sumptuous title-pages, one of which includes *Erica arborea* and *E. manipuliflora*, the latter indeed named by R. A. Salisbury using one of the Sibthorp's specimens collected '*juxta Bujuchtar*' (near Büyükdere) probably on 5 March 1787 when Sibthorp and Hawkins and presumably also Bauer visited the locality (Büyükdere is situated near Istanbul, Turkey). These heathers wreath the frontispiece for volume 4, and are both also brilliantly illustrated within by Bauer (volume 4, plates 351 and 352 respectively). The third heather connected to *Flora Graeca* is *Erica spiculifolia* (*Bruckenthalia spiculifolia*) – also named by Salisbury – which is also superbly depicted in volume 4 (tab 353). Sibthorp had wanted to call it *Erica olympiaca* because they had gathered specimens on the summit of Mount Olympus (Ulu Dag, in western Turkey) during August 1786 – the travellers spent three days on the mountain – but few details of the visit have survived. Sibthorp died in 1796, leaving *Flora Graeca* unfinished, indeed publication had not even commenced, but he left money for its publication.

There is much, much more in this brilliant book, which I would like to commend to all members of the Heather Society, and most especially to those who, like myself, enjoy travelling in the eastern Mediterranean. But I have to add this most off-putting rider. This book costs £250 – and that is not a misprint! This is such an extraordinary price that I cannot even recommend you try to borrow it from your local library.

Professor Lack informs me that very few have been sold, and I am not surprised. OUP have done no service to scholarship nor to potential customers by this outrageous price. [For a more detailed review, see *Botanical journal of the Linnean Society* **131** (2):201–202 (1999).]

E. C. NELSON

D. J. SMALL & R. J. CLEEVELY.

1999. *The Heather Society's Guide to recommended heathers.* Creting St Mary: The Heather Society. Pp 26; illustrated; limp covers. ISBN 0-9500412-8-9. £2.50.

I came across my first Heather Society guide, the *Handy guide to heathers* while I was replanting the Heather Garden at the Sir Harold Hillier Gardens and Arboretum [see *Yearbook of The Heather Society* 1997: 39–47]. Since then it has been a constant companion which is now looking rather tatty!

The Heather Society's Guide to recommended heathers is a companion to the *Handy guide* and focuses on a mouth-watering selection of the best 100 heathers (a well-pared list that must have taken many sleepless nights). I was pleased to see many of my favourites included like *Erica*

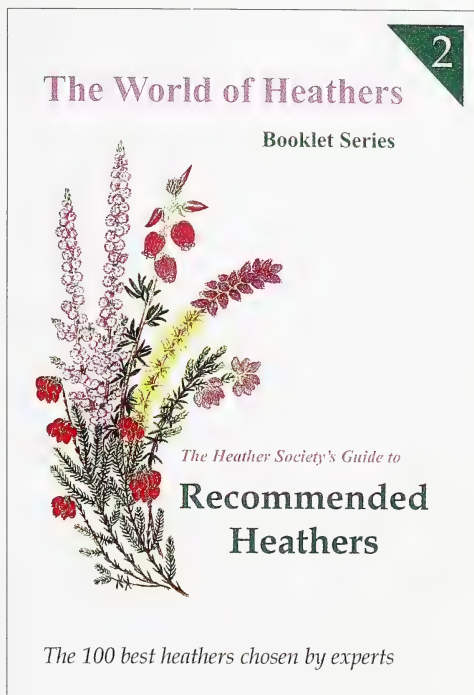
carnea 'Myretoun Ruby' and *Calluna vulgaris* 'Robert Chapman, the less well-known but deserving *Calluna vulgaris* 'Alexandra' and *Erica x oldenburgensis* 'Ammerland'.

The *Guide* has been produced for the Society by David Small and Ron Cleevely and is full of very useful information and tips, of the sort that can only be gained as a direct result of their considerable, combined years of experience.

Aimed at a wide audience, this little 26 page booklet is laid out with lists of heathers according to foliage and flower type, etc., in a familiar and easy to follow manner. Even the contents page follows a logical order. The book concludes with a "Catalogue of the Recommended Heathers". Both the lists and the catalogue are packed full of invaluable information, and the latter includes many small but well-chosen photographs from the Heather Society's slide library.

Through this *Guide* long-time enthusiasts and newly bitten amateurs alike may sample and explore the virtues of heathers as outstanding garden plants, and not simply as collector's items in large displays.

MIKE BUFFIN



INGRAM, D. & ROBERTSON, N. 1999. *Plant diseases. A natural history.* (The New Naturalist Library no. 85). London: HarperCollins. Pp 287; illustrated. ISBN 0-00-220074-0 £34.99 (hardback); ISBN 0-00-220075-9 £19.99 (softback).

The publisher's flyleaf note explains that this latest addition to the established and popular New Naturalist series covers all aspects of diseases encountered by growing plants in the wild, or cultivation on the farm, in the forest, and garden. Beginning with the causes of plant disease, the authors successively deal with invasion of the plant, repulsion and resistance as well as the significance of water. All disease categories are examined, curls, scabs, spots, rots, wilts, mildews, smuts and rusts, with the devastation they can cause including consideration of their ultimate social and economic effects. The various fungal diseases that affect heathers, rhododendrons and conifers such as *Armillaria mellea* (honey fungus), *Fusarium*, *Phytophthora* and *Rhizoctonia* are all discussed but solely from a fungal aspect. However, there is a useful appendix that deals with the practical matters of determining such diseases by examining a plant and obtaining or preserving useful material. There is also an extensive glossary.

Apart from a brief mention of *Erica*, *Calluna* and *Rhododendron* in the discussion of *Phytophthora cinnamoni* (p. 86), the only reference to *Erica* and *Calluna* in the index relates to an interesting section on Ericoid mycorrhiza. At least three different types are believed to exist. In the heathland plants and many species of *Rhododendron*, a fungus identified as *Hymenoscyphus ericae* develops around the fine roots. These roots are heavily colonised, with the fungus penetrating the living cells and also occupying the surrounding spaces with characteristic coils that can make up to 80% of the root's total weight. In the related genera *Arctostaphylos* (bearberry) and *Arbutus* (strawberry tree, madroña) the arbutoid-type mycorrhiza resemble the ectotrophic forms found in forest trees and these hyphae mainly surround the cells although some penetration occurs. In the herbaceous members of the Ericaceae, *Pyrola* (wintergreens) and *Monotropa* (bird's-nests) have a range of mycorrhiza from ericoid to ectomorphic (restricted to forming an outer sheath). Research carried out in North America indicates that the specificity of plant association with mycorrhiza varies considerably having a range from high to low.

R. J. CLEEVELY

JOHANSSON, B. 1999. *Vår Vintergröna Trädgård. Ögonfröjd för fyra årstider.* Västerås: ICA Bokförlag. Pp 120. ISBN 91-534-1883-2.

Excellent, high-quality photos by Brita Johansson taken in her own garden, including heathers, conifers and companion plants. Illustrations include many small sketches and fine portraits of *Erica tetralix* 'Swedish Yellow' (p. 50) and *Calluna vulgaris* 'Röding' (p. 64), both cultivars named by Mrs Johansson. The whole book is designed to inform Swedish gardeners about creating interesting, colourful, evergreen gardens with plants that are hardy in their country.

E. C. NELSON

RECENT PUBLICATIONS

- ANONYMOUS. 1998.** Plant of the week. *Yorkshire Post supplement* (31 August).
Calluna vulgaris.
- ANONYMOUS. 1999.** Ten thousand plants and ... *Hereford Times* (2 September): 28.
The Bannut, garden of Daphne and Maurice Everett.
- ANONYMOUS. 1999.** A crisis over grazing. *English nature* no. 41: 8–10.
Grazing and restoration of heathland on uplands and lowlands.
- ANONYMOUS. 1999.** Moor's value recognized. *English nature* no. 42: 4–5.
'English Nature is designating 44,000 hectares of North York Moors as a Site of Special Scientific Interest, making it the largest inland SSSI in the country.'
- ANONYMOUS. 1999.** Heather bales keep New Forest wetlands wet. *English nature* no. 43: 2.
Use of bales to stem erosion in SSSI but also means heather is harvested and new growth stimulated.
- ANONYMOUS. 1999.** Further HLF windfall for heathland. *English nature* no. 44: 10–11.
Heritage Lottery Funds to restore lowland heaths in England
- BONDUEL, O. 1999.** Bruyères. compagnie. *Mon jardin & ma maison* (January): 21.
Ground cover.
- CABLE, S. & CHEEK, M. 1998.** *The plants of Mount Cameroon. A conservation checklist*. Kew: Royal Botanic Gardens.
Two heathers listed: p. 47 *Erica mannii* and *E. tenuipilosa* (Engl. ex Alm & T. C. E. Fr.) Cheek.
- COWLING, R. & HEYDENRYCH, B. 1999.** Agulhas Plain a brave new fynbos national park. *Plant talk* no 19: 21–25.
Lowland fynbos preserved, with many *Erica* species; splendid photographs.
- COX, D. 1998.** Warm up your winter beds. *Garden answers* (December): 11.
The "heather forecast" citing old cultivars.
- DORR, L. J. & OLIVER, E. G. H. 1999.** New taxa, names and combinations in *Erica* from Madagascar and the Comoro islands. *Adansonia* 21: 77–91.
22 new combinations, 13 new names and one new subspecies formerly assigned to *Philippia*.
- DORR, L. J. & OLIVER, E. G. H. 1999.** A new combination in *Erica* (Ericaceae) from São Tomé. *Kew bulletin* 54: 235–236.
Erica thomensis (formerly in *Philippia*).
- EDGINGTON, M. J. 1999.** *Erica ciliaris* L. (Ericaceae) discovered in the Blackdown Hills, on the Somerset-Devon border (v.c. 3). *Watsonia* 22: 426–428.
10,000 to 100,000 plants on privately-owned farmland that is a SSSI (site of special scientific interest).
- EVERETT, D. 1998.** The wonderful world of heathers. *Flora facts & fables* 16: 6–7.
An admirable account of very varied uses of heathers.
- FLECKEN, J. G. 1999.** *Calluna vulgaris*. *Dendroflora* 35: 24–33
An account of 37 "bud-bloomers".
- FRANCISCO-ORTEGA, J. & SANTOS-GUERRA, A. 1999.** Early evidence of plant hunting in the Canary Islands from 1694. *Archives of natural history* 26: 239–268.
Evidence of *Erica arborea* brought into cultivation in London from Canary Islands in 1694, as a plant and as seed.
- FRENCH, C., MURPHY, R. & ATKINSON, M. 1999.** *Flora of Cornwall. Atlas of the flowering plants ... with notes on some species recorded on the Isles of Scilly*. Camborne, Wheal Seton Press.
Has dot-maps of heathers, pp 126–128; *Calluna vulgaris*, *Erica ciliaris*, *E. tetralix*, *E. cinerea*, *E. vagans* and *E. x watsonii*. *E. x williamsii* mentioned but not mapped

- GALLWEY, S. & WINDER, F. 1998. Distribution of flowering plants on the cliffs at Coumshingaun, Co. Waterford (H6). *Irish naturalists journal* **26** (3/4): 135–137.
Erica cinerea and *Calluna vulgaris* on south- and east-facing cliffs in Waterford.
- GEDDES-BROWN, L. 1999. Heather harvest helps heath. *Country life* (25 March): 84.
 600 tons parcelled into 25,000 bales in the New Forest to block drains.
- GELDEREN, D. M. van 1999. *Andromeda*. *Dendroflora* **35**: 19–23.
 A thoughtful account.
- GLAMMEIER, B. 1999. Callunas planted automatically. *Horticultural industry* **1** (January): 42–43.
 ‘Machine shoots cuttings into multi-trays’, with photograph of a machine (also suitable for *Erica*) which ‘rapidly and precisely’ fills the trays.
- HESTER, A. J. & BAILLIE, G. J. 1998. Spatial and temporal patterns of heather use by sheep and red deer within natural heather mosaics. *Journal of applied ecology* **35**: 772–784.
- HITCHCOCK, A. 1999. All about Ericas. *South African gardening* (October): 26–29.
 “Ericas have been described as the expression of the perfect beauty of geometry and craftsmanship. There are over 700 species of these fynbos plants, of which at least 50 have good garden potential ... [in South Africa!]” In addition to colour photographs of thirteen species, it contains two lists: “Growing tips for ericas” and “Choose an erica” which lists the species by flowering season.
- HOUTMAN, R. T. 1999. Vakbeurs Plantarium ‘98. *Dendroflora* **35**: 152.
Calluna vulgaris ‘David Hageaars’ awarded a silver medal; photograph p. 143.
- JACQUEMENT, A.-L. 1998. *Andromeda polifolia*. *Journal of ecology* **86**: 537–541.
 Biological flora.
- JOHANSSON, B. 1998. Heather, the good companion to conifers. *American Conifer Society bulletin* **25**(4): 150–155.
 Quite outstandingly excellent and comprehensive. The heathers chosen primarily for their hardiness in US Zone 5 but also for their beauty. From 550 cultivars tested, she recommends 40 *Calluna* and 20 *Erica carnea*.
- JOHANSSON, B. 1999. Botaniska nyheter. *Trädgårdsamatören* **1999** (1): 33.
 Notes on *Erica x krameri* (with photograph), *E. x griffithsii* and *E. x oldenburgensis*.
- JOHANSSON, B. 1999. Ljung I svenska färger [Heathers in Swedish colours].
Trädgårdsamatören **1999** (2): 57.
 “Bud-bloomers”.
- KNOWSLEY, J. & MORGAN, A. 1999. Thatchers return to traditional heather. *The Sunday telegraph* (? 5 December): 12.
 “The shortage of straw has revived the use of heather for thatching roofs ...” with a picture of a “cabin in York city centre”.
- LAAR, H. J. van de 1999. Keuringen 1998. *Dendroflora* **35**: 163.
Calluna vulgaris ‘David Hageaars’ again, and *Calluna vulgaris* ‘John Denver’, photograph p. 17 (along with one of *Calluna vulgaris* ‘Marleen’).
- LAUBADÈRE, B. de 1999. *Bruyères*. Edition du Collectionneur, Paris ISBN 2-909450-60-0
 Although written with the help of France’s two leading authorities on heathers, Bernard de La Rochefoucauld and André Danguet, this 60 page A5 book is littered with typographical errors.
- LEAPMAN, M. 1999. Cold comfort. *The garden* **124** (12): 902–907.
 Extolling winter gardens at e.g. University Botanic Gardens, Cambridge, and Wakehurst Place with heathers and photographs.

- McCLINTOCK, D. C. 1999.** Cape heaths crossed with European species. *The new plantsman* 6 (4): 207.
 Formal description and naming of *Erica arborea* x *baccans*, with photograph; *Erica* x *afroeuropaea*.
- McKENZIE, B. 1999.** Kogelberg biosphere reserve is registered. *Veld & flora* 85 (1): 2–3.
 The Kogelberg reserve contains *Erica kogelbergensis* which was described first in *Yearbook* 1996. Our cover photograph is included in this short account [Also featured in an advertisement from Cape Nature Conservation on inside front cover.] (see also E. C. Nelson 1999 below)
- MARRS, R. W., JOHNSON, S. W. & LE DUK, M. G. 1999.** Control of bracken and restoration of heathland. VIII. *Journal of applied ecology* 30 (6): 857–870.
 18 years work on methods.
- MILLER, D. 1999.** Designated standards held in the Royal Horticultural Society's Herbarium, Wisley. [Wisley, RHS]. Booklet [ix], 24 pp.
 A listing of standard specimens for cultivars, including (only) *Daboecia cantabrica* 'Waley's Red', *Erica lusitanica* 'George Hunt', *E. x darleyensis* 'Kramer's Rote' and *Erica* 'Dusky Maid'.
- MITCHELL, R. & HARE, S. 1999.** *Heathland management on arable land at Minsmere: A summary of the research and results 1990–1998 and the costs involved.* Royal Society for the Protection of Birds. £16.95, paperback.
 Provides an overview of a number of separately published research papers and outlines future plans for the RSPB's Minsmere Nature Reserve, Suffolk, England.
- NEGUS, J. 1998.** Create a heather garden. Garden projects. *Womans weekly* (20 October).
 With photographs of *Calluna vulgaris* 'Annemarie' and *Erica cinerea* 'Eden Valley'.
- NELSON, E. C. 1999.** By the Palmiet River in Kogelberg. *Irish garden* 8 (3): 42–44.
 With photos of *Erica massonii*, *E. perspicua* and *E. pillansii*.
- NELSON, E. C. 1999.** Saintry heather. *The Irish garden* 8 (7): 42–44.
 History of St Daboec's heath, *Daboecia cantabrica*, with photos of 'Charles Nelson', 'Celtic Star', 'Bicolor' and 'Praegerae'.
- NELSON, E. C. 1999.** *Wild plants of the Burren and the Aran Islands.* The Collins Press, Cork. IR£9.95. ISBN 1-898256-70-5.
 Includes photographs of *Calluna vulgaris* and *Erica cinerea* both common plants on the limestone of County Clare.
- PASCOE, A. 1999.** Plant of the month. *Gardeners world* (February): 21–22.
Erica carnea 'Myretoun Ruby'.
- PERRY, E. 1999.** Golf clubs help ... heather growth. *Horticultural week* (11 February): 17.
 Questionnaire sent to 2,800 clubs to quantify the extent of heather growth.
- POLATSCHEK, A. 1999.** *Flora von Nordtirol, Osttirol und Vorarlberg.* Bd 2. Innsbruck: Tiroler Landesmuseum Ferdinandum.
 Dot-maps for *Erica carnea*, *E. tetralix* (only 4 sites), *Calluna vulgaris* and *Andromeda polifolia*.
- SPENCE, I. 1999.** Flowering now: *Erica carnea* (winter-flowering heather). *Telegraph magazine* (6 March): 65.
- VILLIERS, M. de 1999.** A rare double for *Erica* hunters. *Veld & flora* 85 (1): 27–29.
 Reprinted in this *Yearbook*!

- WARNER, B. & ROURKE, J. 1998.** *Flora Herscheliana. Sir John and Lady Herschel at the Cape 1834 to 1838.* Houghton, The Brenthurst Press. Limited edition of 1025 copies. ISBN 0-909079-55-2. R 750.
History of the Herschels years at the Cape with reproductions of their botanical paintings, many of which were prepared using a *camera lucida*. Only two Cape heath – *Erica cerinthoides* p. 71, and *Syndesmanthus articulatus* (soon to move into *Erica*) p. 27 – are among the paintings. A sumptuous book.
- WEBB, N. R. 1999.** The practical management of European heathlands. *Journal of applied ecology* **30**: 987–990.
- WHYTE, P. 1999.** Pruning heathers. *Irish garden* **8**(3): 26.
Heathers should be pruned with hedge clippers.

NEW SPECIES, HYBRIDS & COMBINATIONS

- Erica* × *afroeuropaea* D. C. McClintock. *The new plantsman* **6**: 207 (1999) (= *E. arborea* × *E. baccans*).
- Erica armandiana* Dorr & E. G. H. Oliver. *Adansonia* **21**: 77-78 (= *Philippia capitata*)
- Erica barnettiana* Dorr & E. G. H. Oliver. *Adansonia* **21**: 78 (= *Philippia oppositifolia*)
- Erica baroniana* Dorr & E. G. H. Oliver. *Adansonia* **21**: 78 (= *Philippia floribunda*)
- Erica bojeri* Dorr & E. G. H. Oliver. *Adansonia* **21**: 78-79 (= *Philippia aristata*)
- Erica bosseri* Dorr. *Adansonia* **21**: 79
- Erica boutonii* Dorr & E. G. H. Oliver. *Adansonia* **21**: 80 (= *Philippia ciliata*)
- Erica densata* Dorr & E. G. H. Oliver. *Adansonia* **21**: 81 (= *Philippia densa*)
- Erica hebeclada* Dorr & E. G. H. Oliver. *Adansonia* **21**: 82 (= *Philippia trichoclada*)
- Erica lyallii* Dorr & E. G. H. Oliver. *Adansonia* **21**: 84-85 (= *Philippia parviflora*)
- Erica marojejyensis* Dorr. *Adansonia* **21**: 86-87
- Erica perhispida* Dorr & E. G. H. Oliver. *Adansonia* **21**: 88 (= *Philippia hispida*)
- Erica perrieri* Dorr & E. G. H. Oliver. *Adansonia* **21**: 88-89 (= *Philippia latifolia*)
- Erica rakotozafyana* Dorr & E. G. H. Oliver. *Adansonia* **21**: 89
- Erica sylvainiana* Dorr & E. G. H. Oliver. *Adansonia* **21**: 89 (= *Philippia heterophylla*)
- Erica tenuipilosa* (Engl. ex Alm & T. C. E. Fr.) Cheek. *The plants of Mount Cameroon.*
A conservation checklist. Kew: Royal Botanic Gardens.
- Erica wangfatiana* Dorr & E. G. H. Oliver. *Adansonia* **21**: 90

CULTIVAR NOTES

CULTIVARS REGISTERED TO 31 DECEMBER 1999

155. *Erica cinerea* 'Goldilocks'

Registered 22 June 1999: David Malcolm Edge, Forest Edge Nurseries, Woodlands, Wimborne, Dorset BH21 8LS, England.

Golden to lime-green foliage and tidy low growing habit similar to *E. cinerea* 'Eden Valley' from which it was a sport. Flowers lavender (H3) shading to white at base of corolla. Flowers July–October.

Found at Forest Edge Nurseries in 1987 by David Edge.

156. *Calluna vulgaris* 'Fort Bragg'

Registered 31 August 1999: Homer L. Ferguson, 19051 Babcock Lane, Fort Bragg, CA 95437, USA.

Yellow foliage low growing spreading habit as *Calluna vulgaris* 'Foxhollow Wanderer' from which it was most probably a seedling. Flowers purple (H10), August–September.

A chance seedling found by Homer Ferguson at Fort Bragg in 1994.

157 *Calluna vulgaris* 'Golden Wedding'

Registered 1 November 1999: Jack Platt, Fernbank, 176 Southport Road, Ulnes-Walton, PR5 3LN, Lancashire, England.

Habit compact, erect, low; foliage gold in summer, lime-green to gold in winter; flowers none to date.

A chance seedling found in 1996 and named to celebrate Jack and Ruth Platt's golden wedding anniversary in 1999.

158. *Erica umbellata* 'Anne Small'

Registered 11 September 1999: The Heather Society

Bushy upright shrub. White flowers from late May into June. Hardy cultivar. It likes a well-drained soil, grows well in acid soils and may be lime tolerant.

The original plant was collected in northern Spain by Maria Fraga Vila (University of Santiago de Compostela) in 1983, and sent to David Small (Denbeigh Heather Nurseries, Creting St Mary, Ipswich) for propagation (DHN 14/83)

159. *Erica umbellata* 'David Small'

Registered 11 September 1999: The Heather Society

Bushy upright shrub. Amethyst (H1) flowers from late May into June. Hardy cultivar. This plant was collected at Cabo Vilano, La Coruña, Galicia, in north-western Spain, by David McClintock, David Small and Charles Nelson on 21 July 1982 (DHN55/82).

It was illustrated and described in *Yearbook of The Heather Society* **1999**: 10. In error, the cultivar name was printed as 'David J. Small' in *Bulletin of The Heather Society* **5** (18): 4 (1999).

160. *Erica x garforthensis* 'Tracy Wilson'

Registered 25 November 1999 David Wilson, 6605 Hopedale Road, Chilliwack, British Columbia, V2R 4L4, Canada

The plant is slightly fragrant, has small pale pink, almost white flowers in compact cylindrical racemes July - October. Slightly variegated light green foliage. The new growth is tipped creamy yellow. It has a compact spreading habit 25cm x 45cm (assumed after three years). The hardiness is untested. Old flowers persist until late spring. Lower branches slightly ascending. Very floriferous. (See page 19)

A deliberate cross in 1996 between *Erica tetralix* 'Melbury White' and *Erica manipuliflora* 'Korçula' and named after the youngest daughter of David and Irene Wilson, born 1988 (see p.18, this issue).

NEW ACQUISITIONS

Calluna vulgaris

'Gaia' [new name, established here]

Raised at Värgron, Sweden by Brita Johansson and named after a mythical Greek goddess.

Shoots erect when young, but later, habit broad, spreading; foliage dark green; flowers single, reddish-purple, August to September. Very hardy.

'Glenfarclas' [new name, established here]

Introduced by David Hutton, Perthshire, Scotland and named after a famous Speyside distillery and malt whisky of the same name.

Habit erect; foliage yellow-green; flowers single, mauve, August to September.

compiled by J. PLATT

Fern Bank, 176 Southport Road, Ulnes-Walton, nr Leyland, Lancashire PR5 3LN
with additional information from D. J. SMALL

CULTIVAR NAMES RECORDED IN 1999

Calluna vulgaris 'Annegarda'

Clone CLL 77; submitted for plant breeders' rights in Germany by Rainer de Winkel (Goch, Germany) on 1 October 1996.

refs: *Blatt für Sortenwesen* 31 heft 12: 430 (December 1998); *Der Heidegarten* 46: 47 (1999).

Calluna vulgaris 'Anneliese'

Clone CLL 75; submitted for plant breeders' rights in Germany by Rainer de Winkel (Goch, Germany) on 1 October 1996.

refs: *Blatt für Sortenwesen* 31 heft 12: 430 (December 1998); *Der Heidegarten* 46: 46 (1999).

Calluna vulgaris 'Aphrodite'

Sport on 'Amethyst'. Clone CLL 100; submitted for plant breeders' rights in Germany by Kurt Kramer (Edeweicht-Süddorf, Germany) on 1 April 1998.

refs: *Blatt für Sortenwesen* 32 heft 3: 69 (March 1999); *Der Heidegarten* 46: 47 (1999).

Calluna vulgaris 'Beckerbursche'

Recorded in Botanischer Garten, Bremen, Germany, in 1998.

ref: *Der Heidegarten* 44: 32 (1998).

Calluna vulgaris 'Bispingen'

Recorded in Botanischer Garten, Bremen, Germany, in 1998.

refs: *Der Heidegarten* 44: 32 (1998); __ 46: 41, 44-45 (1999), with illustration in *Heidelexicon*.

Calluna vulgaris 'Black Snow'

Clone CLL 73; submitted for plant breeders' rights in Germany by Rainer de Winkel (Goch, Germany) on 17 September 1996.

refs: *Blatt für Sortenwesen* 31 heft 12: 430 (December 1998); *Der Heidegarten* 46: 46 (1999).

Calluna vulgaris 'Christa'

Clone CLL 79; submitted for plant breeders' rights in Germany by Rainer de Winkel (Goch, Germany) on 1 October 1996.

refs: *Blatt für Sortenwesen* 29 heft 11: 428 (Nov. 1996); __ 29 heft 12: 475 (Dec. 1996).

Calluna vulgaris 'Feldberg'

Recorded in Botanischer Garten, Bremen, Germany, in 1998.

ref: *Der Heidegarten* 44: 32 (1998).

Calluna vulgaris 'Jessika'

Clone CLL 71; submitted for plant breeders' rights in Germany by Rainer de Winkel (Goch, Germany) on 5 September 1996.

refs: *Blatt für Sortenwesen* 31 heft 12: 430 (Dec. 1998); *Der Heidegarten* 46: 46 (1999).

Calluna vulgaris 'Karla'

Clone CLL 81; submitted for plant breeders' rights in Germany by Rainer de Winkel (Goch, Germany) on 1 October 1996.

refs: *Blatt für Sortenwesen* 29 heft 11: 428 (Nov. 1996); __ 29 heft 12: 475 (Dec. 1996); *Der Heidegarten* 43: 43 (1998); __ 46: 47 (1999).

Calluna vulgaris 'Klauwina'

Clone CLL 98; submitted for plant breeders' rights in Germany by Kurt Kramer (Edeweicht-Süddorf, Germany) on 27 January 1999.

refs: *Blatt für Sortenwesen* 32 heft 3: 69 (March 1999); *Der Heidegarten* 46:47 (1999).

Calluna vulgaris 'Laura'

Clone CLL 82; submitted for plant breeders' rights in Germany by Rainer de Winkel (Goch, Germany) on 1 October 1996.

refs: *Blatt für Sortenwesen* 29 heft 11: 428 (Nov. 1996); __ 29 heft 12: 475 (Dec. 1996).

Calluna vulgaris 'Minka'

Clone CLL 114; submitted for plant breeders' rights in Germany by Rainer de Winkel (Goch, Germany) on 2 June 1999.

refs: *Blatt für Sortenwesen* 32 heft 7: 235 (July 1999); *Der Heidegarten* 46: 47 (1999).

Calluna vulgaris 'Red Beauty'

Clone CLL 37; submitted for plant breeders' rights in Germany by Franz Maassen & Gerd Canders (Straelen, Germany) on 31 January 1994 under the preliminary designation 'Dark Beauty'; in May 1994 the proposed denomination was published.

ref: *Blatt für Sortenwesen* 27 heft 5: 329 (May 1994).

Calluna vulgaris 'Red Giant'

Recorded in Botanischer Garten, Bremen, Germany, in 1998.

ref: *Der Heidegarten* 44: 34 (1998).

Calluna vulgaris 'Roter November'

Clone CLL 42; submitted for plant breeders' rights in Germany by Manfred Kerski (Apen, Germany) on 31 August 1994; withdrawn on 28 September 1995.

refs: *Blatt für Sortenwesen* 27 heft 10: 426 (Oct. 1994); __ 28 heft 11: 437 (Nov. 1995).

Calluna vulgaris 'Schneewolke'

Clone CLL 89; submitted for plant breeders' rights in Germany by Karl Bückers (Goch-Nierswalde, Germany) on 30 September 1997.

refs: *Blatt für Sortenwesen* 31 heft 7: 266 (July 1998); *Der Heidegarten* 46: 47 (1999).

Calluna vulgaris 'Starlet'

Clone CLL 41; submitted for plant breeders' rights in Germany by Manfred Kerski (Apen, Germany) on 31 August 1994; withdrawn/rejected on 28 September 1995.

refs: *Blatt für Sortenwesen* 28 heft 5: 235 (May 1995); __ 28 heft 11: 437 (Nov. 1995).

Calluna vulgaris 'White-beauty'

Clone CLL 52; submitted for plant breeders' rights in Germany by Günther Antons (Bad Zwischenahn, Germany) on 18 November 1994; withdrawn on 4 October 1995.

refs: *Blatt für Sortenwesen* 28 heft 8: 349 (Aug. 1995); __ 28 heft 11: 437 (Nov. 1995).

Daboecia x scotica 'Katherine's Choice'

Flowers cerise, May-July; foliage green. To 20cm tall.

Raised by David Edge and introduced in 1999 by Forest Edge Nurseries, Wimborne, Dorset, BH21 8LJ.

ref. *Heather catalogue* 1999, Forest Edge Nurseries

Illust. *Heather catalogue* 1999, Forest Edge Nurseries (colour photograph).

THE HEATHER SOCIETY

Chairman:

Mr D.J. Small: Denbeigh, All Saints Road, Creting St Mary, Ipswich, IP6 8PJ.

Secretary:

Mr R. Clevely: High Croft, Gunswell Lane, South Molton, EX36 4DH.

Treasurer:

Mr A. Hall: 10 Upper Green, Nanpantan, Loughborough, LE11 3SG.

Registrar:

Mrs J. Julian: Matchams, Main Street, Askham Richard, YO23 3PT.

Administrator:

Mrs A. Small: Denbeigh, All Saints Road, Creting St Mary, Ipswich, IP6 8PJ.

Slide librarian:

Mrs J. Julian: Matchams, Main Street, Askham Richard, YO23 3PT.

Editor of *Bulletin & Press Officer*:

Mrs D. Everett: The Bannut, Bringsty, WR6 5TA.

Editor of Yearbook

Dr. E. Charles Nelson

Tippitiwitchet Cottage

Hall Road

Outwell

Wisbech, Cambridgeshire, PE14 8PE

Tel: 01945 773 057

Fax: 01945 774 077

e-mail: tippitiwitchet@zetnet.co.uk

All material for the 2001 issue of the *Yearbook of The Heather Society* must reach the Editor not later than 31 October 2000.

Articles may be submitted by e-mail.

DATES OF PUBLICATION OF YEARBOOKS

1994: 19 July 1994

1995: 22 February 1995

1996: 8 March 1996

1997: 7 March 1997

1998: 18 February 1998

1999: 15 March 1999

YEARBOOK OF THE HEATHER SOCIETY

2000

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NEW SPECIES AND HYBRID NAMED IN THIS ISSUE

Erica x garforthensis D. McClintock

Erica ignita E. G. H. Oliver

Erica kirstenii E. G. H. Oliver

